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STANDARD

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IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

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THE UNVEILING OF ISIS.

IV.

We have thus briefly glanced at the lives and deeds of these three great characters of history, and shall now pass on to a general view of the historical side of this sublime question.

One grand and remarkable fact in the peopling of our country is that each colony was formed as a church, and each leader called to his work as with the inspiration of heaven. In the words of our great historian, "Every enterprise of the Pilgrims began from God."

"On the voyage they constantly served God, morning and evening, by reading and expounding the Scriptures, by singing and prayer. On the Sabbath day they added preaching twice and catechising; twice they faithfully kept solemn fasts. The passage was pious and Christian-like, for even the ship's company set their twelve and eight o'clock watches with singing a psalm and prayer."

On the ship, as it sped over the ocean toward the west, like an eagle, a branch of the church was formed.

"The worke we have in hand is by mutual consent, through a

special overruling Providence and a more than ordinary approbation of the churches of Christ, to seeke out a place of habitation and consortship under a due form of government, both civil and ecclesiastical. For this we are entered into covenant with God; for this we must be knit together as one man, always having before our eyes our commission as members of the same body, soe shall we keepe the unitie of the spirit in the bond of peace. The Lord will be our God and delight to dwell among us as his own people; we shall see much more of his wisdom, power, goodness and truthe than formerly we have been acquainted with. He shall make us a prayer and glory that men shall say of succeeding plantations: 'The Lord make it like that of New England.'"

The early history of America affords many an incident, many a scene that might well be wrought into an effective tableau. One such was the landing of Columbus on San Salvador: the conqueror of a new world, kissing the sands of his conquest, while the color-bearer raises up the banner of Spain, and the wondering savages stand in the background—all this furnishes the material for a heroic spectacle. Another was the landing of the Pilgrims. Hudson's "Great Bird of the Sea," as the poor Indians thought it, majestically sailing up the Hudson, would command the admiration of those of greater knowledge than the untutored savage.

Whence are those mournful Pilgrims, whose story of praise is always like the plaintive notes of the mourning dove—they are the remnants escaped from St. Bartholemew—the Huguenots, landed safe, far out of the reach of persecution. No words of execration or of condemnation escaped from them, but their language was worthy of followers of their Master: "And thou, dreadful prince, whom we once honored as our king, and whom we yet respect as a scourge in the hand of Almighty God, thou also shalt have a part in our good wishes. These provinces which thou threatenest, but which the arm of the Lord protects; this country, which thou fillest with refugees, but fugitives animated with love; those walls which contain a thousand martyrs of thy making, but whom religion renders victorious—all these yet resound bene-

dictions in thy favor. God grant the fatal bandage that hides the truth from thine eyes may fall off! May God forget the rivers of blood with which thou hast deluged the earth, and which thy reign has caused to be shed! May God blot out of his book the injuries which thou hast done us; and while he rewards the sufferers, may he pardon those who exposed us to suffer! O, may God who hath made thee, to us and to the whole church, a minister of his judgments, make thee a dispenser of his favors—an administrator of his mercy!"

At a later day, on a more southern river, we see another grand picture of history. We behold a vessel filled with wondering and awe-struck Friends, a peaceful and charitable community of brave hearts, glide up the Delaware. William Penn is among them. The historian will choose the moment of his landing for the great tableau of this drama. From his manly port and the resolution which his countenance displays, you would take him to be a warrior, if the mild philanthropy which beams from his eyes did not reveal the nature of his professions still more than the simplicity of his garb.

Foremost among the great and good whom the providence of God raised up as instruments for the building of this nation, was this good man, of whom the historian has said: "If any fault can be found with his conduct, it is that his charity was a little too universal—a little too indiscriminate." He was a striking exemplar of Joseph in his purity, in his sufferings, in his portions, for he had two—Pennsylvania and Delaware—two in one, and above all, in that spirit which breathed forth in the words of Joseph: "Now, therefore, be not grieved nor angry with yourselves that ye sold me hither, for God did send me before you to preserve life. He sent me before you to preserve a posterity in the earth and to save your lives by a great deliverance." His whole soul was filled with charity. He felt as Joseph did, that God was with him and that he was an instrument in his hands to do well. His colony established, he sailed for England, but before his departure uttered these remarkable words: "My love and life to you and with you, and no water can quench it nor distance wear it out or bring it to an end. I have been with you, cared over you, and served you with un-

feigned love, and you are beloved of me and near to me beyond all utterance. And thou Philadelphia, the virgin settlement of this province, named before thou wert born, what love, what care, what service and what travail has there been to bring thee forth! O, that thou mayest be kept from the evil that would overwhelm thee, that faithful to the God of thy mercies, in the life of righteousness, thou mayest be faithful to the end. My soul prays to God for thee, that thou mayest stand in the day of trial, that thy children may be blessed by the Lord and thy people saved by his power."

The meeting of the first Congress has been described as awfully solemn. The most eminent men of the various colonies were now, for the first time, brought together; they were known to each other by fame, but were personally strangers. The object which had called them together was of incalculable magnitude. The liberties of no less than three millions of people, with that of all their posterity, were staked on the wisdom and energy of their counsels. "It was such an assembly," says John Adams, who was present, "as never before came together on a sudden errand, in any part of the world. Here are fortunes, abilities, learning, eloquence and acuteness equal to any I ever met in my life. Here is diversity of religious education, manners, interests, such as it would seem impossible to unite in one plan of conduct. The Congress was opened with prayer. The psalter, the 35th psalm for the day, was read the 7th of September, 1774. *Plead my cause, O Lord, with them that strive with me; fight against them that fight against me. Take hold of shield and buckler and stand up for my help. Draw out also the spear and stop the way of them that persecute me. Say unto my soul, 'I am thy salvation.'*" The inspiring words of this psalm spoke the fullness of all hearts present.

"I never saw," continues Mr. Adams, "a greater effect upon an audience. It seemed as if heaven had ordained that psalm to be read that morning. Then Mr. Duché, the minister, struck out into an extemporaneous prayer, which filled the bosom of every man present. Never was a prayer heard with such fervor, such ardor, such earnestness and pathos, and in language so eloquent and sublime—for America, for the Con-

gress, for the province of Massachusetts Bay, and for Boston especially." George Washington was especially devout on this occasion, kneeling while others stood.

The papers of this Congress were pronounced master-pieces of practical talent and political wisdom. Lord Chatham said: "For myself, I must declare and avow that, in the master States of the world, I know not the people or Senate who, in such a complication of difficult circumstances, can stand in preference to the delegates assembled in General Congress at Philadelphia."

Of the long struggle of the colonies that succeeded this first meeting of this Congress, of daring acts in the field and in the cabinet, of the bold Declaration of Independence, and of its electrical effect upon the colonies, we shall not speak now, but pass on to the ever memorable 14th of June, 1777, when Congress resolved "That the flag of the United States be thirteen stripes, alternate red and white; that the Union be thirteen stars, white in a blue field, representing a new constellation."

No more noteworthy instance of retributive justice, under a Divine Providence, can be found than that of the fashioning of our flag by the hands of Elizabeth Griscom, and afterwards by her daughter, Clarissa Claypole, a descendant of Oliver Cromwell. Three messengers—like the three angels who came to Abraham's tent to announce to him that his seed should be as the stars of heaven—three messengers, George Washington and two of his officers, appeared before Elizabeth Griscom, mother of this noble woman, and, authorized by Congress, confided to her skilled hands the making of all the flags—the setting of those stars typifying the seed of Israel restored, which should lead the hosts of the new Israel to victory and to freedom.

**"THOU HAST GIVEN A BANNER TO THEM THAT
FEAR THEE, THAT IT MAY BE DISPLAYED
BECAUSE OF THE TRUTH."**

Is it not a striking coincidence, that upon the shield or coat of arms handed down from century to century to George Washington, and borne to the fight with Saracen by his ances-

tors for the possession of the Holy Land, are to be found the colors of this flag, with a wonderful trinity of stars or cadences, placed there perchance in those early ages, prophetically as symbols of those God-like men to whom, under Almighty guidance, our country owes its existence—Columbus, Luther, Washington?

The Dove. The Swan. The Eagle.

The Cross. The Trumpet. The Sword.

The Pilot. The Prophet. The Prince.

The blue blanket of the Covenanters, raised for Christ, Crown and Covenant at that memorable epoch—the downfall of kingcraft in England—was the emblem of heaven, in which a church appeared—the woman clothed with the sun.

Those bright stars which spangled this heaven were the crown of the woman—the twelve united colonies of America brought forth from a church in travail—twelve because two of the colonies counted as one, as did two of the tribes of Israel, and as thirteen apostles were reckoned as twelve.

Those gorgeous stripes came from the streakings of the morning light of the glowing sun, which burst forth at the birth, surrounding and clothing the woman, our freed church: The blue of the fold symbolizing Heaven, Truth, Constancy; the white, Purity, Joy, Light; the red, The Holy Spirit, Creative Power, Heat.

Time and space would fail me to follow the cause of our sacred banner, that

*"Imperial ensign that full high advanced,
Shone like a meteor, streaming to the wind,"*

through the seven dark days of peril—through its evil hours and its triumphs—to Lexington, to Bunker Hill, to Lake Champlain, to Brandywine, to the glorious field where Burgoyne, "the boaster," was routed to the tune of "Yankee Doodle"—the same air and words, with little variation, as were flung as a lampoon at Cromwell and his yeomanry in military uniform, with hat and feather, as they marched into London; played in derision by the British at Lexington, and returned by our men with interest, when Burgoyne's soldiers stacked their arms. Again to Germantown, to Princetown, to Valley Forge, with

its bloody footprints, the Gethsemane of the Revolution, to the great sea fight of the famous John Paul Jones on his Ironsides, to Stony Point, to the gloomy hour of betrayal by one of the twelve, and to the final victory at Yorktown, when the combined forces of HEAVEN AND OF EARTH crowned the Nation's emancipation from tyranny.

Then the great war drama closes, with the remarkable spectacle of a whole army, with its leader, assembling on the field and kneeling in prayer of thanks to Almighty God for this surprising interposition in its favor.

In Philadelphia another striking scene presents itself,—the Congress of the Nation marching in solemn procession to the Dutch Lutheran church to offer up thanks to God for the mighty deliverance of the people.

Later, at the invitation of the French embassy, upon the occasion of the glorious success of the allied armies, Congress, the assembly of Pennsylvania, and principal persons of various orders, assembled in the Catholic church in Philadelphia, where a most remarkable address was delivered by Abbé Bandole, solemn prayers offered and a Te Deum sung.

Thanks, noble France, who, though you gave us those scourges of Almighty God—Charles IX and Louis XIV—gave us a Calvin, a Fenelon, a Lafayette, a Rochambeau, a Louis XVI, born to repair the breach, yet to expiate on the scaffold the sins of his fathers. Thanks for your thinkers—thanks for your statesmen—thanks for your lofty men of arms, for without these WE WOULD NOT HAVE BEEN.

And among the gathering of the nations, thanks, blessed little Holland, the refuge and protector of the persecuted! Thanks, brave, oppressed Poland, for a Kosciusko! Thanks, favored Germany, for a Huss, a Luther, a Copernicus, a De Kalb, a Steuben! Thanks, glorious Italy, for a Christopher Columbus, a Galileo, a Michael Angelo, a Dante. Thanks for your pilot, your poet, your philosopher! Thanks, proud Spain, for a Torquemada, a Charles V, an Isabella! Thanks, old England—our good mother—for a Wickliffe, a Cranmer, a Knox, a Charles I, a Cromwell, a Milton, a Pitt, a Burke! Thanks, prophets! Thanks, persecutors! Thanks, martyrs!

Thanks again to you, good mother, that you cast us out in our adversity; and, above all, thanks to God who saved us from your bondage, when you would have claimed us in our prosperity.

Let us never hereafter speak lightly of our noble forefathers, to whose greatness of soul, undaunted heroism and undoubted piety, we owe the temple of LIBERTY which shields us to-day.

If, in a frivolous moment, the word Puritan or Quaker should be spoken in derision, let us ask ourselves: "Are we able to be baptized with the baptism with which they were baptized?"

Take to heart these words of Alexander Everett, a truly representative American, whom I knew and honored as a boy:

"Scion of a mighty stock,
Hands of iron, hearts of oak,
Follow, with unflinching tread,
Where the noble fathers led.

Craft and subtle treachery,
Gallant youth I are not for thee;
Follow thou, in words and deeds,
Where the God within thee leads!

Honesty, with steady eye,
Truth and pure simplicity,
Love that gently winneth hearts,—
These shall be thy only arts.

Prudent in the council train,
Dauntless on the battle plain,
Ready, at the country's need,
For her glorious cause to bleed.

Where the dews of night distil
Upon Vernon's holy hill;
Where, above it, gleaming far,
Freedom lights her guiding star;

Thither turn the steady eye,
Flashing with a purpose high!
Thither with devotion meet,
Often turn the Pilgrim feet!

Let the noble motto be,—
God—the Country—Liberty!
Planted on religion's rock,
Thou shalt stand in every shock.

Laugh at danger far or near !
Spurn at baseness, spurn at fear !
Still, with persevering might,
Speak the truth and do the right !

So shall peace, a charming guest,
Dove-like in thy bosom rest ;
So shall honor's steady blaze
Beam upon thy closing days.

Happy if celestial favor
Smile upon the high endeavor ;
Happy if it be thy call
In the holy cause to fall.

Thus we have traced our God-given ensign through the ages. We have read of it in the pages of prophecy and the stars of the heavens. Man, in all his weary march across the sands of time's desert, in the long, toilsome journey of the race through the black night of the middle ages, burdened by error, bigotry, persecution and oppression; in his toilsome march through the forests of Gaul and Germany, on his perilous expeditions in the wild North sea, in his voyage of fear and terror across the wide Atlantic, yea, even into the confines of a new world, amid danger, death and desolation, such as to make the on-looker despair of the race, adown the pages of history may we read that this glorious prophecy has been followed. Our glorious banner comes from the stars to plead with man "be free." Monuments may consecrate, arches of triumph may perpetuate, man's love for LIBERTY, but in the folds of the American banner is she herself an ever constant spirit, in the stars and stripes—a *goddess* revealed. Oh, America, ever and forever cherish, defend, adore thy heaven-born banner, for the prophecy of its coming fell from Jehovah's lips.

CHARLES LATIMER.

THE ALTAR AND PILLAR TO JEHOVAH.

IV.

The builder of such "an altar to Jehovah" as the Great Pyramid must have known the name of the Being to whom he built it, and his inscription on its pure white surface could not have been, "To the Unknown God," but is most likely to have been the original of the subsequently familiar Hebrew inscription, "Sacred to Jehovah." This is said to be a more literal translation of the original than "Holiness to Jehovah." Moreover, whoever looks upon the Great Pyramid as built "for a witness to Jehovah of hosts in the land of Egypt," ought to look upon it as built by a patriarch subsequent to Jacob; for God said to Moses, "I appeared unto Abraham, unto Isaac, and unto Jacob, by the name of God Almighty,^a but by my name JEHOVAH was I not known to them."—(Ex vi. 3.) We must, therefore, either give up our idea that the Great Pyramid was built expressly as "an altar to Jehovah," or else admit that it was built by Joseph, the first heaven-inspired man who could have dedicated it to Jehovah by name, as well as the only one of whom the Bible records both the opportunity and the wisdom to have built it. Confirmatory to this conclusion is the remarkable fact that Jacob, the last inspired man before Joseph, named his last altar "EL-BETH-EL" (*God of the House of God*), and that Moses, the first inspired man after Joseph, named his first altar "JEHOVAH-NISSI" (*Jehovah my banner*). If ever an altar before this bore the name of Jehovah, it must have been the "altar to Jehovah in the midst of the land of Egypt." Moses was Joseph's standard-bearer (figuratively speaking, of course), and bore on his banner the name in which Israel was to vanquish the foes of righteousness and truth.

In view of the military significance of this first altar of Moses, and in view of the fact that the Great Pyramid's stair-like form of construction was either "battlement-wise" or "altar-wise,"

whichever one might choose to call it, it will hardly be said that I have abandoned the advocacy of the Great Pyramid as "an altar to Jehovah" in my endeavor to show that it is referred to in the Bible under the name of "Migdol," the Great Tower. When the purport of the further mention of Migdol in the sacred Scriptures shall have been considered, it will be convenient to show clearly, both rationally and inspirationally, that the Great Pyramid's character as a tower and its character as an altar are perfectly consistent with each other. That Migdol still exists, being identical with the Great Pyramid and identified with the adjacent region round about it, has been pretty well proven, I think; but the Bible's mention of the place a second, a third and even a fourth time, will be sufficient to either overthrow or confirm my previous conclusion, by locating the Great Tower on the Gizeh rock, or else by showing it to have been situated elsewhere. Truth alone can give unanimity to several independent witnesses; therefore, "Out of the mouth (not mouths) of two or three witnesses every word shall be established."

Migdol is commonly supposed to have been a fortress, with a garrison, somewhere on the Isthmus of Suez; and "between Migdol and the sea" is commonly supposed to have been between this fortress and the head of the Gulf of Suez, which was crossed by the Israelites through the parting of its waters, from Egypt to the Sinaitic Peninsula, although, by their supposed crooked route out of Egypt, they could have reached Mount Sinai much more conveniently without crossing the sea at all. Against this roundabout way to the western shore of the Gulf of Suez, let me here add this fatal objection: that the "six hundred thousand men on foot," with their still larger number of women and children, and with their flocks and herds, could not possibly have traveled it in three days. By the straight route from Ra-Meses to the sea, each day of the "three days' journey" was a little over twenty-five miles—as far as such a pedestrian caravan could travel in that length of time, however great its haste to escape from rapacious pursuit. "Succoth" and "Etham," in Egypt, were mere names of the first and second days' encampments. That the exodus was due

east, on the latitude parallel of the middle of the three great pyramids, is in admirable harmony with Mr. Robert Ballard's "Geodesic Theory" of the Pyramid of Egypt, which rests, like the military theory which Lieutenant Totten ought to propose, on the impregnable foundation of necessity. (See INTERNATIONAL STANDARD, Vol. II, p. 31.)

And now in regard to the supposed situation of Migdol on the Isthmus of Suez. This "wide gate" of the "broad road" from Canaan down into Egypt was, and still is, a desert waste, including a few spots fertilized by irrigation, without a rock for a tower to stand upon; and if the Great Tower was anywhere in that region of sandy foundations, it would not have been mentioned by Jeremiah as existing in his time, one thousand years after the mention of it by Moses. Indeed, from Egypt's deserted border land on the east to its populous interior, not a rock greeted the traveler until he came to the rock of Gizeh, in the very *midst* of Egypt; and on this rock the prototypal shepherd of Israel planted his Great Tower of the Flock so firmly that it "remaineth until this day," and is likely to remain till the last jot and tittle of its prophetic teaching shall have been fulfilled.

After the mention of Migdol in the description of the exodus, the next mention of it is in the forty-fourth chapter of Jeremiah, which begins with an address to Jews dwelling "in the land of Egypt at Migdol, and at Tahpanhes, and at Noph, and in the country of Pathros," threatening them with the judgments of heaven for "burning incense to other gods in the land of Egypt." The depth of the offence must have lain in the region where the gods of Egypt were chiefly worshiped, beginning with Migdol, in the *midst* of Egypt, and including the capital city, Noph, or Memphis, on the south, and the royal city a little to the north of the Gizeh pyramids, *i. e.*, Tahpanhes, of which "the decayed and filthy village of Gizeh, once adorned with magnificent palaces," appears to be the ruin, and including Pathros, the nativity of the Pathrusimite branch of the Mizraimites, whose chief city was Beth-Shemesh, or Heliopolis, the city of the sun. In this catalogue of idolatrous places, the one in, the absolute *midst* of the land of Egypt,

whether the Great Sphinx was what Professor Smyth thinks it, "the biggest idol in the world," or not, should naturally be the one first mentioned. According to this, Migdol was not a solitary spot on the Isthmus of Suez, but was the whereabouts of the Great Pyramid of Gizeh, and took its name from this altar to Jehovah in its original character of the Great Tower.

Jeremiah's address to the idolatrous Jews in Egypt was in person, he being there with them though against his will; and the story of his doings there identifies Tahpanhes with Gizeh, and Pathros with the country of which the chief city was Beth-Shemesh, the Egyptian Baal-beck, where Baal and Astarte were worshiped under the names of Isis and Osiris. As to Noph, no one denies that it was identical with Memphis. Thus the entire region occupied by "the remnant of Judah" in Egypt, who were brought down there by Johanan to save them from being added to the captivity in Babylon, did not exceed twenty miles square, with Migdol in the midst. The objective point of the immigration was Tahpanhes, and thence it spread to the neighboring cities. The record of Jeremiah, the prophet, by the hand of Baruch the scribe, is this: "Thus came they to Tahpanhes. Then came the word of Jehovah unto Jeremiah in Tahpanhes, saying: Take great stones in thine hand, and hide them in the clay in the brick-kiln, which is at the entry of Pharaoh's house in Tahpanhes, in the sight of the men of Judah; and say unto them, Thus saith Jehovah of hosts, the God of Israel: Behold I will send and take Nebuchadnezzar, the king of Babylon, my servant, and will set his throne upon these stones that I have hid: and he shall spread his royal pavilion over them. And when he cometh, he shall smite the land of Egypt, and deliver such as are for death to death, and such as are for captivity to captivity, and such as are for the sword to the sword."—(Jer. lxiii. 7-11.) I suppose that the "great stones" were three, to represent the tribes of the house of Judah—Judah, Levi and Benjamin. I suppose, too, that they were "whole stones," like those by which Joshua and Elijah represented the thirteen tribes of Israel in their altars to Jehovah in the land of Canaan. That the stones hidden by Jeremiah near the palace of Pharaoh-Hophra, in Tahpanhes,

represented the Jews in a royal city not far from the capital city of Egypt, to which Nebuchadnezzar was to carry his conquest, is very evident; and if Tahpanhes was not far from Noph, it must have been very near to the situation of the Great Pyramid, which I take Migdol to have been. Thus Tahpanhes is identified with the once palatial city of Gizeh, which less than twenty years ago was not so "decayed and filthy" but that the Khedive of Egypt had a palace there. That Pathros can be as clearly identified with the country in which Heliopolis was situated I cannot say, but it seems probable from this: "Then all the men which knew that their wives had burned incense unto other gods, and all the women that stood by, even all the people that dwelt in Pathros, in the land of Egypt, answered Jeremiah, saying: As for the word which thou hast spoken unto us in the name of Jehovah, we will not hearken unto thee; but we will certainly do whatsoever thing goeth forth out of our own mouth, to burn incense unto the queen of heaven, and to pour out drink offerings unto her, as we have done, we, and our fathers, our kings, and our princes, in the cities of Judah, and in the streets of Jerusalem."—(Jer. xlv. 15-17.) In Egypt the "queen of heaven," Isis, the wife of Osiris and the mother Horus, was the supreme divinity, the "one and all things, past, present, and to come;" and the principal temple and image-worship of this Egyptian trinity was in Beth-Shemesh. Therefore, "when the women burned incense and made cakes, and poured out drink offerings to the queen of heaven, it was not without their men;" and therefore Jehovah by the mouth of Jeremiah, speaking of Nebuchadnezzar, said to them and to their subordinates in this idolatrous worship: "He shall break also the images of Beth-Shemesh in the land of Egypt; and the houses of the gods of the Egyptians shall he burn with fire." All this throws light on the whereabouts of Migdol, pointing to near midway between the capital city of Egypt and the city of the sun.

The next mention of Migdol is in the forty-sixth chapter of Jeremiah: "Declare ye in Egypt, and publish in Migdol, and publish in Noph, and in Tahpanhes: say ye, Stand fast, and prepare thee; for the sword shall devour round about thee."

Here again Migdol is placed first, and in the same relation to Noph and Tahpanhes, seeming to indicate its position between the two, with Noph, which was undoubtedly Memphis, to the south of it, and with Tahpanhes, if this was Gizeh, to the north of it. On this theory the proclamation of the war declared against Egypt comes to the right places in the right order, *i. e.*, 1st, to the place of the Great Tower, of the treasury strongholds, the military headquarters; 2d, to the capital city, where the Pharaoh sat in state and administered the laws; and 3d, to the city where he held his court and his royal entertainments, and where he might have enjoyed domestic life to his heart's content but for his ambitions and the enmity of rival princes. May not the name Tahpanhes have been bestowed upon this royal city by the Pharaoh of Solomon's day, in honor of his motherly queen, Tahpenes, whose sister he gave in marriage to that enemy of the house of David, Hadad the Edomite? I incline to think so, because the name does not occur as that of a place until after the story of the queen who bore it, which we find in the eleventh chapter of 1st Kings. In the French national library is a book on good morals and manners by Ptah-Hotep, an old Egyptian courtier of the fifth dynasty. I therefore incline to think that the name of the Egyptian queen, and of her royal residence, Tahpenes or Tahpanhes, might be more properly written Ptah-Penes, showing an etymological relationship to Ptah, the oldest of the Egyptian gods, and Menes or Manes, the first king of the first dynasty, who instituted the worship of Ptah, and built him a magnificent temple in Memphis. If there is any truth in this idea, Migdol, between two cities so intimately connected as Noph and Ptah-Panhes, is not hard to find.

It is mentioned once more, and in a way, I think, to identify it no less plainly with the situation of the Great Pyramid. In the sixth verse of the thirtieth chapter of Ezekiel we read concerning Egypt and the Egyptians: "From Migdol to Syene shall they fall in it by the sword, saith the Lord Jehovah." This is according to the marginal reading, but the *A. V.* is quite as good if we substitute "to" for "of," to make sense, giving us "From the tower *to* Syene," instead of "From the tower

of Syene shall they fall in it by the sword." The prophet evidently intended the reader to understand that the Egyptians were to fall, like corn before the reapers, from one end of the fat valley to the other, beginning with the Great Tower at the apex of the delta, and ending with Syene, in the region of the cataracts, whence they brought the granite called "Syenite," so conspicuous in their obelisks and in the images in their temples of the gods. It is as if one were to prophesy the destruction of the inhabitants of the valley of the Mississippi, from the Crescent City to Cairo. He would mean, not from some obscure cross-roads in Alabama to Cairo, but from New Orleans, on a bend in the river near the head of the delta, to Cairo. So, when Ezekiel prophesied the destruction of the inhabitants of the valley of the Nile, "from the Great Tower to Syene," he meant, not from some obscure out-post on the uninhabited Isthmus of Suez to Syene, but from the Great Citadel, in the midst of the populous cities at the head of the Delta, to Syene.

My idea of the primary object of the pyramids of Egypt is this: That each one was built for the special purposes of a citadel, and that these were two: 1st, that of a stronghold for the perpetual security of the royal treasures, and for the safety of the royal family in times of emergency; and 2d, that of a military vantage-ground, from whose top to watch the approach of enemies, and from whose battlemented sides to hurl at them the weapons of warfare. As to the most natural reason for so many of them, I take it to be this: That on the death of the Pharaoh for whom the Pyramid was built, it was converted from a tower into a tomb, by the religio-military order of which he had been the head, his embalmed body being placed in a granite sarcophagus, and therein slid down the descending passage into the subterranean chamber, with the stately and solemn services becoming the occasion, after which the top and battlemented sides of the tower were builded upwards and outwards, from the proportions of the altar of whole stones into the more exalted π proportions of a pyramid proper, and finished with the capstone and casing stones, all without the sound of a hammer. This transformation from a tower to a

tomb necessitated the building of another tower for the treasury and defensive purposes of the dead king's successor; and when this other tower had in like manner been converted into a shrine sacred to the memory of the heroic virtues and achievements of the deceased, it gave occasion for still another. In this way the multiplication of pyramids only ceased with the complete subjection of Egypt to her foreign invaders.

The construction "in steps, battlementwise," in which, no doubt, all the pyramids of Egypt were like the Great Pyramid, does not satisfy our idea of the safe and commodious ground on which the warriors needed to stand in actual warfare. Great terraces, like those of Birs Nimrud, as described by Herodotus, approach much nearer to our idea of what should be, and satisfy us altogether if we are allowed to defend the standing-ground of each with a rampart. That such larger terraces, consisting of flat-roofed blocks of houses, were built upon the smaller terraces, as upon the sides of a trap-rock mountain, and that their interiors served for barracks, while their belligerent tops were reached by the smaller terraces on which they were built, will be shown by abundant evidences hereafter. On the tops of these great terraces were arranged the munitions of war, including, I suppose, pyramidal heaps of round stones, like those of cannon balls beside the hurling implements of modern warfare. Such pyramidal mounds of round stones seem referred to in the words, "Cast a mount against Jerusalem," which in the margin are made to read, "pour out the engine of shot" against Jerusalem.—Jer. vi. 6.) Also in the words, "He shall make a fort against thee, and cast a mount against thee," where for the last part of the passage the margin substitutes "pour out the engines of shot" against thee.—(Ezekiel xxvi. 8.) If I am right in this comparison, the little pyramidal mounds of iron balls in our forts and arsenals, and on board our ships of war, are lineal descendants of a very venerable ancestry, and may be taken as symbols of the commonwealth they are intended to defend, answering, in a manner, to the pyramid on the reverse seal of the United States.

Such was evidently the significance of the altar built by Moses, probably of whole stones, after the battle with the as-

sailant Amalekites, when God said, "I will utterly put out the remembrance of Amalek from under heaven." The statement is this: "And Moses built an altar, and called the name of it JEHOVAH-NISSI" (*i. e., Jehovah my banner*); "for he said, Because the hand of Amalek is against the throne of Jehovah, therefore Jehovah will have war with Amalek from generation to generation."—(Ex. xvii. 15, 16.) I even think that the singular means by which the victory over Amelek was accomplished bore a sort of representative relationship to the three great pyramids of Gizeh—Moses, on his stone, answering to the middle pyramid, "A-Mosis"; Aaron, staying up the hand of Moses "on the one side," answering to the right hand pyramid, "In-Aron"; and Hur, staying up the hand of Moses "on the other side," answering to the left hand pyramid, "Ur," or "Aramæus." In view of these reminiscences of Migdol, and in view of the attribute of Jehovah as "a man of war" (Ex. xv. 3), saying that the character of the Great Pyramid as "an altar to Jehovah" is consistent with the idea of its having been originally known as the Great Tower, and with its having continued to bear that name in the days of Moses and the prophets, is both scriptural and reasonable. Indeed, the Great Pyramid, as newly revealed, is to a goodly number of modern Israelites what "Jehovah-nissi" was to Israel of old; for now, "when the enemy cometh in like a flood, the spirit of Jehovah lifteth up a standard against him," and on its banner we see inscribed a figure of the "altar to Jehovah in the midst of the land of Egypt," signed with the sign of the cross, with the motto, "*In hoc signo vinces.*" "The treasures of Egypt," in which the Pharaohs trusted, but which Moses, in view of "the recompense of reward," esteemed of less value than "the reproach of Christ," made Egypt an object of intense cupidity to "the kings of the East." It was, therefore, a military necessity with the Egyptians to locate their capital city and their strongholds, their last resort for the safety of their kingdom, on the west bank of the Nile, placing the river between them and their most powerful enemies, and keeping their transports moored on the same side with their defences. Moreover, through all time, battle-grounds have been burial-

grounds, and therewith they have been places for monuments to immortalize dead heroes. Gradually the great battle-ground of Egypt became a vast necropolis, and the strong towers, on whose battlemented sides the warriors bled and died for the preservation and glory of their country, became monuments of the representative heroes that slept beneath them. In ancient Egypt, as in all other countries and times, the greatest hero was the rightful king; and kingship, by the law of heredity as well as by acquisition, represented the heroism of the people. To Jacob God said: "Thy name shall no more be called Jacob, but Israel; for as a prince hast thou power with God and with men, and hast prevailed." To such an Israelite as the inheritor of the birthright, the translation of the battling tower into the monumental tomb could easily signify conversion of the altar of sacrifice on which the Christ was to lay down his life for the salvation of his kingdom into an altar of witness, "a memorial forever" of his heroic deed. In this case, the altar of sacrifice was the kingdom of David, consisting of the thirteen tribes of Israel, represented by the altar of whole stones: and the altar of witness into which it is being converted is the kingdom of the Christ, the inheritance of the Son of David, consisting of the twelve tribes of mankind, represented by the twelve foundations of the Holy City, inscribed with the names of the twelve apostles of the Lamb, and constituting the Great Pyramid of the world.

A so-called Philistian, a worshiper of Jehovah, so influenced Cheops and Cephren as to be the actual ruler of Egypt, in their stead, for eighty years, even to the extent of keeping closed the temples of the Egyptian gods, in opposition to the powerful influence of the Egyptian priests during that time, and for forty-two years after. Is it too much to believe that such a man was inspired with an insight into the life of man on this planet, from the beginning to the end of it, including the world of truth involved therein? If not, it is not too much to believe that he was endowed with the ability to embody it in the parts and proportions of the Great Pyramid, making its situation "in the midst of the land of Egypt" commemorative of "the tree of life in the midst of the garden;" making the

excavation of its subterranean chamber, under the baleful influence of the constellation of the dragon, symbolic of the fall of man and his loss of Paradise, through the subtlety of "that old serpent, the devil;" making the Sakkara stage of its development representative of the altar of their people and their God, on which the Christ and his disciples were to bleed and die in mortal conflict with the powers of darkness; making the conversion of the tower into a monumental tomb, at the death and expected apotheosis of the Pharaoh for whom it was ostensibly built, significant of the "altar under which are the souls of them that were slain for the word of God and for the testimony which they held;" and making its state of finish and perfection, in which it looked like a snow-white tent "let down from heaven by the four corners," prophetic of the descent of the Holy City, New Jerusalem, "prepared as a bride adorned for her husband," offering "to him that overcometh" the long-lost "right to the tree of life, in the midst of the Paradise of God," by entering in "through the gates into the city." Moreover, if the Great Pyramid represented the history of man on the globe, from the fall to the restoration, from infernal to angelic, or at least from savage to saintly, it represented the *microcosm* in the generic and also in the individual sense of the word, from its entrance into this world to its translation into the next; and it must needs have represented the *macrocosm*, in the sense of the world on which we live, from its igneous beginning to its paradisaical ending, and in the sense of the material universe, from its nebulous and chaotic condition to that order and harmony which make the stellar heavens a symbol of the angelic and divine.

This complex individuality of the Great Pyramid freely admits of every intention claimed for it, not excepting, in times of peace, that of an astrological observatory, in the character of a watch-tower devoted to the observation of the stars, like that of the wise men who came from the East to Jerusalem, and even to the manger in Bethlehem, guided by the star of "Him who was born King of the Jews." But that so many prodigious pyramids were built, each for casting the horoscope of a particular king, when it was sufficient to have served such a

purpose for a whole dynasty of kings, and when the horoscope could have been as well cast without any pyramid at all, I can no more believe than that each was built for the tomb of a particular king, to the exclusion of the legitimate inheritors of his throne, and in defiance of all artistic and poetic ideas of beauty and significance in the architecture of a mausoleum. Military necessity, first and last, occasioned by the possession of vast wealth in precious stones and metals, by danger to the royal person and family in the straitness of a siege, by the convenience of a vantage ground immediately outside the priceless objects to be defended, and by conversion of the strong tower into a grand monument in honor of one but temporarily vanquished in a conflict with death, seems to me the only rational explanation of such a long line of prodigious pyramids, extending, as they do, from the northernmost limit of a solid base to stand upon, southward, against Theban and Ethiopian invasion, and confronting the Assyrian and Babylonian contestants for the dominion of the world on the east. In a truly scientific and philosophical view of the matter, the Great Pyramid is to be regarded as one of the pyramids of Egypt, explainable in the same way with the rest, but as one of them in the same sense that the Christ, the Son of David, is one of the multitude of mankind, to be revealed as "the Christ, the Son of the living God," when the Israelite indeed "shall see heaven open, and the angels of God ascending and descending on the Son of Man."

J. W. REDFIELD.

THE HISTORY OF REDEMPTION.

The special object of this article is to show that the history of redemption, as typified by the feasts of the Lord in the Jewish year, according to the law of Moses as recorded in the twenty-third chapter of Leviticus, is symbolized by and in the Pyramid. If this can be shown, we then indeed have Job's wish: "Oh, that my words were now written! Oh, that they were printed in a book! that they were graven with an iron pen and lead [cement?] in the rock forever! for I know that my Redeemer liveth, and that he shall stand, at the latter day, upon the earth" (xix. 23-25). We have both—the printed and the stone book; and both record just what Job had engraven, as it were, upon his soul, to keep him in his hour of extremity—the final and complete salvation from sin and life to enjoy it forever.

"The circular theory," as it has been called, as related to the Pyramid, was suggested to the writer by the diagram in *The Approaching End of the Age*, at page 458, while reading that able work. This theory shows the complete history of the redemption of Israel, even to the specified days as recorded in the chapter referred to, by the aid of additional light given the writer on the passage-chronology, and is the antitypical year of Leviticus xxiii, as has been shown by Mr. Guinness. This able writer, however, has only shown the analogy between the months of millenaries in one scale, and the months of the Jewish feasts in the other, without any attempt to particularize on the likeness of the days of one scale to the same days in the other; and whatever appears in this article on the correspondence of the particular days mentioned in the type, is entirely original with me.

Now, it seems very evident that, if we have the antitypical year, the antitypical days must be there; for those days are especially what marked the seventh month of the year, and this month, as the liberating and harvest month, is the goal of the hope of Israel. That those days are there, I think I can show.

Mr. Guinness has shown that the most probable duration of our Lord's life on the earth was thirty-three years, seven months and seven days, elsewhere (*Our Rest*, November and December, 1880) shown to be 33.6 years. Mr. Guinness has also shown that, if we construct a year on the scale of 33.6 years for a day, a millenary corresponds very nearly to a month in the type, 1008 years being just a month of 30 days. This great year is what, it is claimed, is built in the Pyramid by its symbols.

The passover in the type has not its chronological likeness in the history of redemption, but chronologically reverts to the exodus of the children of Israel from Egypt, and is so stated in the Scriptures. But the antitypical passover has its proper place in the redemptive history, occurring in the first part of the fifth month. And how fitting this is when compared with seed-time and harvest; for there was the sowing—creation, then in the fifth month, the first ripe fruit—our passover, fifty-six days thereafter the first ripe fruits, and then the harvest, near the middle of the seventh month. Redemptive history, then, is analogous to the sowing and harvest year.

The first chronological feature in the type relating to the history of redemption is the fiftieth day after the first Sabbath after the passover, then the memorial of blowing of trumpets in the first of the seventh month, and then the tenth and fifteenth days of the seventh month. It is designed to show that all of these features in redemptive history are built in the Pyramid as surely as symbols can show them, though not in the order here given; for in the antitype the memorial of blowing of trumpets comes first after the passover, and then that memorable fiftieth day. Time will tell the truthfulness or erroneousness of the symbols.

This theory has been called very questionable because of the indefiniteness of the angles of the passages, but I think it can be demonstrated that the angles any one may use (within the limits of Prof. Smyth's trials) will not in the least effect its truthfulness. In doing this it will be necessary to make use of the following diagram:

The reader will at once recognize B, at an altitude of thirty degrees, as the angle of the celestial pole, and A and C as the

Adam, and his first day in this circle was a Sabbath. "And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and sanctified it, because that in it he had rested from all his work which God created and made."—(Gen. ii. 2, 3). Then, by subtracting one from 127 and dividing by 7, we ascertain that D is a Sabbath in this antitypical year. This is the day of our Lord's birth, for as the first ascending passage leads to it in the Pyramid, the angle of that passage leads to it in the circle. Now, add one (for this was the exact length of his life on the earth), and we have for our passover the first day after a Sabbath, as indicated by E. The next feast, after all the service connected with the passover, occurred on the fiftieth day after the first Sabbath after the passover. In the scale we are considering, the first Sabbath after the passover, which occurred at F, was six days later than the passover, which occurred at E; counting, then, fifty degrees or days from F, we are brought to the day marked by H. Let me prove this. From A to G are just 180 days, and as H marks the fourth day ($3^{\circ} 16'$) from G, so H is the 184th day from A; then, as there are 128 days from A to E, and yet six days from E to F, we have 134 from A to F; now the fifty days from F to H make 184, the number from A to H. But this is only one side.

We next assume that the rise of A is $26^{\circ} 18' 10''$, and that of D is $25^{\circ} 49' 15''$ (Mr. Muir's computation again), the two extremes the other way, and then the distance between the two is $127^{\circ} 52' 35''$, or D marks the 128th day from A. We have already seen there are 134 days from A to F; then, as there are 128 days from A to D, from A to E would be 129, leaving five days intervening from E to the end of the next Sabbath at F. Counting fifty days from F, we reach the day marked by H; for 134, the number from A to F, and fifty, the number from F to H, are 184, the number of days we before ascertained there were from A to H.

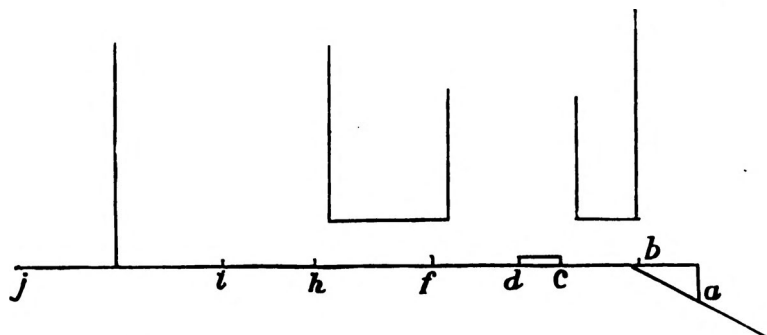
I am very sure of one thing, if it was a mathematical problem, and the demonstration was as explicit as the foregoing,

every member of the Institute would hail it with joy. But I do not expect this in regard to a proposition of this kind.

G marks the close of the sixth and the beginning of the seventh month in this antitypical year. Of the type, we read: "Speak unto the children of Israel, saying, in the [seventh month, in the first of the month, shall ye have a Sabbath, a memorial of blowing of trumpets, an holy convocation. Ye shall do no servile work therein, but ye shall offer an offering made by fire unto the Lord." And we see the antitype of this in the growth of Britain and the rise of this nation before and at the time of the Revolution. Not full liberty, but "a memorial of blowing of trumpets," and the memorial has been on the increase.

H is the day in which the two antitypical wave loaves, the first fruits unto the Lord from among men, are to be offered. This day closes in 1917 A. D., if we use $26^{\circ} 44'$ for A and $26^{\circ} 18' 10''$ for D; but if we use $26^{\circ} 18' 10''$ for A and $25^{\circ} 49' 15''$ for D, it closes in 1886 A. D. Any intermediate points for A and D would vary the close in proportion to the change made. No more important day than this occurs to the church, which is the body of Christ, the antitypical first fruits; but there are two more days in this seventh month that are of great importance to Israel, which we will now consider.

Before continuing the demonstration, we will have to turn to the grand gallery, the ante-chamber, the king's chamber, and their connecting low passages, and in our investigation will make use of the diagram below, to make clear my meaning.



It is chronicled of the ante-chamber's north wall: "It is

rough with pick-marks," and it is believed it is for chronological purposes by showing a displacement. The amount of displacement is shown by the position of the raised granite, cd, in the floor of this chamber. The north wall, then, for chronological purposes only, would stand at c, the north edge of the raised granite, and the south wall at f, thus placing the chamber 13.22 inches south; and this is its true chronological position. This places the north wall of the king's chamber at h. The ante-chamber is displaced for two purposes,—one to show a mathematical problem, and the other to show a Biblical statement in connection with chronology. The latter is the statement that "those days should be shortened." The fact that 13.22 inches of this floor is limestone, and the succeeding granite one is raised, shows it does not properly belong to this chamber, but that the chamber has been set over it by displacement. But if the north wall of this chamber belongs at c, why did not the raised granite extend to f? This surely would have been the case if a continuous chronology through this chamber and onward had been intended, or had been the only object. The reason it did not extend to f was to show the true chronological length of the low passage to the king's chamber, which is from f to i, 168.96 inches. We accordingly, therefore, place the south wall of the ante-chamber at d, and then, by expansion, as it were, we lengthen the raised granite to its true chronological length of 116.26 inches, which places the south edge at f where the south wall chronologically belongs. In doing this we place the king's chamber in its true chronological position, with its north wall at i, and the south wall at j, 68.96 inches farther south, 82.18 inches of displacement in all, for this chamber.

I think one thing will be admitted. Had the architect designed to show this displacement of chambers and passages, a more clear and simple plan could not have been devised. It is decidedly unique.

We are now ready to see how this is related to the circle, and to show that we are not necessarily confined to one set of angles, although I believe there is one set intended, and that it lies between those we are at present using.

From the beginning of the grand gallery to f, measured over the step, is 2091.98 inches, or years. From D to J is 2084.41 years; for assuming that our radius line at D is at an angle of $26^{\circ} 18' 10''$, and G at $26^{\circ} 44'$, we have $53^{\circ} 2' 10''$ from D to G, then add 9 degrees and there are $62^{\circ} 2' 10''$ from D to J, the close of the ninth day of the seventh month of this great year, and this multiplied by 33.6 produces 2084.41. Now, as we have already seen that from the beginning of the grand gallery to the south wall of the ante-chamber, rightly located chronologically at f, is 2091.98, and as 2084.41 is the close of the ninth day, f is in the tenth day, thereby marking it in a very definite and pyramidal manner.

But suppose D is at $25^{\circ} 49' 15''$ and G at $26^{\circ} 18' 10''$, their sum would be $52^{\circ} 7' 25''$; then add 9 degrees to bring us to J, and we have $61^{\circ} 7' 25''$; this multiplied by 33.6 gives us 2053.75 years to the close of the ninth day. From the beginning of the grand gallery to f, measured through the step, is 2063.58, or, if the hypotenuse be reckoned from a to b, about 2066; so that, as 2053.75 is the close of the ninth day, f would be in the tenth day, and marking it in as definite a manner as before.

It may be said by some that the beginning of the ante-chamber, rather than its close, would mark the tenth day, it being the day of atonement; but I wish to show this is not the case; that the position of the south wall, in relation to the raised granite, speaks, symbolically, the language of the Scriptures concerning this day. In Leviticus, in the chapter before referred to, they were told to afflict their souls and offer an offering made by fire, and that the soul that would not be afflicted should be cut off from his people. Now, if the south wall marks the tenth day, what does the low passage to the king's chamber say? Be afflicted. This is self-imposed; for as the Christ was made perfect through suffering, so Israel must be in like manner. As the symbol shows the low passage was shortened or cut off, so it says: "Be afflicted or be cut off;" and it will be a cutting off indeed, for this is the reality of which theirs was only the type.

The fifteenth day of this seventh month is as definitely

marked by the north wall of the king's chamber, rightly located chronologically at i, as we saw the tenth day was at f by the south wall of the ante-chamber; for from the close of the ninth day to the close of the fourteenth is five days, which, multiplied by 33.6, gives 168 years, and from f to i is 168.96, so that, as there are five days from J to K, there are the same number from f to i.

This great year is not essentially affected by the theory advanced by some, that the beginning of the grand gallery marks the crucifixion, instead of our Lord's birth; for in that case D would be the passover instead of E, as I have here used, F still being the first Sabbath after the passover, and our reckoning from that onward would be the same.

When it was first presented to my mind that the year of solilunar cycles was symbolized by the Pyramid, the question that was then impressed upon me was: How much time had elapsed from A to D, and did it correspond with the rest of the Pyramid and the Bible by any consistent mode of interpretation. I did not then have any length for the entrance passage, but I soon had James Simpson's π length, as given in the *Banner of Israel*, vol. ii, page 90, which was 1089.6 from the outer surface of the casing-stone at O to the junction with the first ascending passage at P. Upon reading this I immediately added thereto the length of the first ascending passage, 1542, and the 1656, to the flood in our Bibles, and obtained the sum of 4287.6; and this without any attempt at fractional exactness. I had not then tried to ascertain the distance from A to D, but now, with these figures, I could test the probability, at least, of my theory. With the mean of Prof. Smyth's trials, $26^{\circ} 27'$ for the entrance passage, and $26^{\circ} 6'$ for the first ascending passage, we have intervening between A and D $127^{\circ} 27'$, and with 33.6 to a degree, we obtain 4282.32. This was sufficiently close to establish strong probability, for it wanted but ten minutes of a degree to be almost exact. But if D was the birth of Jesus, where was the second advent and the first fruits, which many were advocating were at hand? With D at $26^{\circ} 6'$ and H at 30° , I had $56^{\circ} 6'$. Now 56 times 33.6 are just 1881.6. Supposing that H marked the exact time (which I do not in this article,

but that it only points to the day), it would allow me six minutes of the ten wanted from A to D. Was it strange I should feel my theory quite well established? and should undertake to modify the angles somewhat? I think not; neither will any candid reader of the STANDARD. But this theory did not depend upon 1881.6 for support; and to-day I have stronger confirmations and am more grounded in my belief, for the day marked by H is not ended yet, nor can it be absolutely proved to be so until after 1893, and perhaps 1916, unless the angles of A and D can be absolutely determined within a minute or so. The stronger confirmations are the tenth and fifteenth days of the seventh month, for I had not then been presented with this additional light. But, although I think the theory is established on stronger and better grounds, yet those former confirmations are confirmations still.

But I have something to say in regard to the angles I have been using. I do not think they are quite so indefinite, but have used them thus in order to anticipate, as it were, any objections that might be raised in this way. I believe in a complete passage-chronology from the creation down, and that it corresponds exactly with the circular theory; that one corroborates the other, and that in this way we can decide, not absolutely, but with strong probability, very nearly the angle of the first ascending passage. I believe Mr. Thomas Wilson, in *Our Rest* for November, 1880, very conclusively showed the correct angle for A was $26^{\circ} 24'$; this being true, I think the angle of D can be shown to be less than 26° , about $25^{\circ} 56'$. Mr. Wilson has shown also, in *Our Rest* for January, 1880, the missing Pyramid-link at the beginning of the passage-chronology, from the creation to the flood. I unite this missing link with its successor in a little different and more definite way than I have ever seen it stated elsewhere. I do it in this way: When the step is reversed and enlarged, the joint in the low passage to the ante-chamber coincides with the first joint in the floor of the entrance passage above P. By ascertaining the hypotenuse of the step to said joint, and increasing its length by the same process as we increase the size of the step, and adding thereto the distance from the first joint above P to P, we have

the exact length of the entrance passage and the first and missing link in our passage-chronology; this gives about 2746.6. This number is the 1656 years to the flood, and the year of the flood, in our Bibles, making 1657; the 101.6 from the flood to the dispersion, of our Bibles, (Gen. xi. 10-16) and the measured distance from that dispersion to the exodus at P, 988, making 1089.6. Any one will at once recognize the 101.6 as the thickness of the casing-stone, or the distance from the beginning of the entrance passage to O, the outer surface, so that the flood is marked by this latter point. Then, if to 2746.6 we add 1542.6 (the correct number according to measuring rod, *Our Inheritance*, page 661) we obtain 4289.2; and with A at $26^{\circ} 24'$ and D at $25^{\circ} 56'$, we have $127^{\circ} 40'$ from A to D, which gives 4289.6. The very fact of so close a correspondence with the Bible and of these two theories of the Pyramid with each other, gives strong support to their correctness; for there seems to be no broken links in the Bible down to the time of Terah, but one continuous chain, link by link. However, the Bible numbers are given in whole numbers, and when the exact hypotenuse of the step to the joint is given, they may vary some.

But I have somewhat to say on the measured angles of the passages. About all that I have ever seen written concerning these have been attempts to give the true theoretical angle, and in this way to show they were all intended to be the same. I do not attempt to show there is not a theoretical angle, but I claim the measured angles were not intended to be the same. We know, according to Prof. Smyth's trials, the angle of the first ascending passage is less than the others, and yet I have never seen any reason suggested for this; but this circular theory gives us just the reason, and in a very decided manner. This theory also gives the reason why angles close to 26 degrees were chosen in preference to all others; why it was greater than the theoretical angle in the entrance passage, and less in the first ascending one. It was because of the position of these lines to each other and their position to the other lines in the diagram, and the relation of them all to the history of redemption.

Now, with some definiteness to our angles, we see that the tenth and fifteenth days of the seventh month are marked by measuring either through or over the step. 2060.8 from D brings us to J, the close of the ninth day; and, measured through the step, f makes 2064.33, and is, therefore, in the tenth day; but if measured over the step, f is at 2091.73; and then, if we add to 2060.8 the tenth day, 33.6, we have 2094.4 as the close of the tenth day, so that f would then be in it, though at its close. The fifteenth day is marked by i in the same way. For myself, at present, at least, I prefer to measure through the step to b, which makes the grand gallery's length about 1884.

Let us notice some other chronological points. The diagonal L points to 624.96, or the 19th day, in which the birth of Enoch took place, at 6:22 A. M. The flood transpired in the 50th or first jubilee day, and on a Sabbath. The apex marks the day in which the fine lines in the entrance passage occur. The death of Abraham, at the age of 175 years, probably took place in this day also, about fifteen years after the fine lines, he being born when his father was eighty years old. This is the most probable view, for Terah was seventy before either son mentioned was born, and it is more than probable that Haran was the oldest. That Terah was not too old is evident, because Jacob was ninety years old when Joseph was born. This being true of Abraham, we not only have the fine lines as the date of the building, but of Jacob's birth—the birth of Israel and his (their) altar to the Lord! No two events were more likely to be made to synchronize than these, and they are just what we would expect to be synchronous at this time.

The southern air channel, or the diagonal at M, at a rise of 45 degrees, would mark the accession of Josiah, the boy king of Judah, in 641 B. C., a notable event, as any one will see by turning to II Kings, xxii. and xxiii., and reading his biography. N is at 871.36 A. D., and Alfred the Great ascended the throne in this day in 871. The importance of this event needs no explanation, I trust, to any reader of the STANDARD. G marks the close of the sixth and the beginning of the seventh month. The change occurred in 1758.4 A. D., about the first of the

year 1759. This year was the turning point in favor of the English in the French and Indian wars for the supremacy in this country, and was the year in which the war closed in this country. Before the close of this day the independence of the United States was fully established. September 9-11 has been stated as a very important date, and has been thought to be marked in a very decided manner, if it was only searched out. I know not what will satisfy the mind in this case, but it seems to be pointed to in a peculiar way, although not by any direct line that I have yet been able to discover. It is in this way:—September 9-11, 1774, brings us to the close of that year when we consider that Jesus was born early in the autumn, perhaps in September; and the close of 1774 brings us within two and one-fourth minutes of a degree of a line drawn through the centre of this day. The appointment of Washington as commander-in-chief, on June 14th, 1775, occurred within less than a minute of the central line of this day, in the first half, and the Declaration of Independence very nearly the same distance from that line in the last half. There is a monthly feature to this year that is very significant, which I must notice before closing, the beginning of each month being marked by an event that was lasting in its result.

First month. The first day of this month was Adam's first day; by him was the earth to be peopled.

Second month. The second day of this month was the birth of Noah, from whom the earth was peopled after the flood.

Third month. The fourth day of this month witnessed the fine lines—the beginning of Israel and their “altar to the Lord in the midst of the land of Egypt.”

Fourth month. The beginning of Israel's monarchy and the cementing together of the tribes into a brotherhood, which was never completely broken, began in the very first of the sixth day or last of the fifth, very near the turning point between the two. This is, probably, near the close or southern end of the granite in the first ascending passage.

Fifth month. In the eighth day, the beginning of the Christian era.

Mark the day of the month of each event, up to this month,

a methodical increase in the time of beginning each event. I think this is to show the month is more than one thousand years long, for immediately this increase is omitted, and the event begins near the first of the month.

Sixth month. Alfred the Great began his reign in the fourth day, and became the sovereign of all England by recognition. His reign was marked with wonderful success and prosperity to the nation. But the importance of this event can not even be approximated here. In the tenth day occurred the Norman conquest, which needs no explanation to a believer in our Israelitish origin.

Seventh month. The beginning of what? A theocracy that is to culminate in what? We are living in the fourth day! What is at hand? Will the first fruits be offered soon? Will Jesus gather, out of his kingdom, all things that offend at the time of the harvest? and will the harvest of Israel be completed by the fifteenth?

Eighth month. Will the resurrection of the rest of the dead, the Gentiles, begin in the first of this month, at the close of the one thousand years' reign?

If I am not mistaken, the blind passage at the southern end of the subterranean or Gentile chamber leads us into the eighth month.

S. H. REEVE.

South Eliot, Me.

A CRITICISM OF MR. N. B. WOOD'S SYSTEM OF WEIGHTS AND MEASURES.

My sympathies go out to the Institute strongly and fervently. The metric system, priding itself on its scientific origin, on its beauty, symmetry and convenience, yet conceived in sin and born in iniquity, deformed, severe rather than symmetrical, rigid, inflexible, rather than convenient—this system is abhorrent to my Saxon soul. When I learned that there is in this country a society of scientific and influential men pledged to “preserve and protect Anglo-Saxon weights and measures,” my delight was unbounded. The perusal of the *STANDARD* gives me much pleasure. Like Mr. Skinner, I should like to be one of two hundred to contribute \$10 per year to its support until it becomes self-sustaining. *I think this scheme should be pressed.*

I have read the report of Mr. Wood, of the Committee on Weights and Measures. Supposing it to be subject to discussion and criticism, I must say that it is objectionable. He says: “We must have a decimal system or we will be compelled to adopt the metric system.” Why so? It is not apparent that any considerable number of persons are clamoring for decimal weights and measures except the avowed atheistic enemies of the English system, a few importing merchants on the seaboard, a few closet philosophers who seldom use weights and measures, but who would gladly undertake to prepare textbooks in conformity with the metric system, and a few book publishers who would like to do the printing, and thus increase the amount which their unconscionable extortion has already wrung from a helpless public. The *people* find no inconvenience and express no complaint. The wheat of all this region was weighed by the pound. No other unit was found necessary, and any farmer's boy ten years old can convert the sum total into bushels. “Sixteen ounces make one pound; 2000 pounds

equal one ton," is table enough for weight. It is sufficiently simple and comprehensive. If the pound be taken as the unit, it is difficult to see what good result would accrue from a decimal division of the pound. Farmers do not use ounces in weighing crops, and the grocer would certainly prefer a scale that permits the division of the unit into halves, fourths, eighths and sixteenths. For the uses of scientific men, special scales might be provided as at present. I have never heard a complaint as to our present weights and measures from common people.

The decimal system, notwithstanding the claim of its advocates, is not a "natural" but a highly artificial system. Nature does not use the decimal scale of variation. The distances and dimensions of the planets do not increase from Vulcan and Mercury outward in multiples of 10. In her laboratory, Nature does not use decimal proportions in combining her elements. Why then should we exhaust patience seeking for a cosmic—natural—unit only to engraft on it a system of variation that nature never uses? *The 10 is the fatal defect in the metric system.* This may seem to some a rash assertion, but I make it with a full knowledge of my responsibility. I am fully persuaded that all the inconvenience attending the use of that system springs from the very property on which its friends base its claims to popular favor. A cast-iron system with a *fixed unit* and an *inflexible ratio* must be productive of much inconvenience, and will not be accepted by the people. For scientific purposes, the scientific man, if willing to accept an arbitrary unit, can do no better than take the metric system; but the Institute is "preserving and protecting" weights and measures *for the people*. It must preserve first, protect afterward. Does Mr. Wood keep this in view? On looking at the tables, I can see but two words which I recognize as belonging to weights and measures—the pound and the inch. Depend upon it the people would demand the restoration of all of which these tables would rob them. Nor do I think they would accept such substitutes as podes, decapodes, hectopodes and kilopodes. These names have less of euphony, and are in no sense an improvement on metric nomenclature. These tables are metric

tables in disguise ; and their adoption by the Institute would in my opinion be equivalent to an unconditional surrender. We lose the mile, the pint, the ounce, the acre—all the short, sharp, crisp Saxon words which are a part of our every-day speech, dear to us as a legacy from remote ancestors, and old perhaps as the Pyramid itself.

Again, Mr. Wood says: "A measure suitable for a board or a piece of cloth is suitable for the earth's surface." This principle carried into practice will ruin any system as it has ruined the French. How would it be possible to comprehend the diameter of a spider's web expressed in decimals of a mile? or the capacity of the Pacific in fluid ounces or minims? These illustrations are extreme, but they will answer my purpose. Astronomical distances are incomprehensible in terms of any unit, but they would be utterly bewildering expressed in inches or twelfths of an inch. The fact is we must have different units for different purposes. If we must accept the tables as presented, or adopt the metric system, I should not hesitate to embrace the latter, odious as it is. If our Saxon weights and measures are to be disguised, maimed and deformed, it will matter little whether the unit is retained or not. Time is happily beyond the power of men to tamper with. In this, the most irregular of our tables, the people experience no difficulty and express no complaint. The days and the years will continue to measure out their line as in the past, and the record of the ages will remain unchanged while the present order of the universe exists.

I have written candidly and kindly. It is well perhaps we cannot all see alike. In a multitude of counsel there is wisdom. My object is to give my voice against committing the Institute to any system of weights and measures different from those now in use, until the most careful thought, searching investigation and extensive experiment shall have proven it beyond dispute rigidly accurate, convenient, comprehensible by the people and acceptable to them. The work of the Institute will have to stand their verdict. Let us not forget for whom we are working.

Our present tables have thus far held their own against the

metric system. Nor would the French system have made such progress had it been generally recognized that there was a "battle of the standards." The metre has conquered the German and the Latin States, but we have the Anglo-Saxon world. We have England, Australia and Russia. We have *Egypt*,* too, with its Pyramid, and India with its teeming millions waiting for English civilization, English law and English measures. And we have America, whose English civilization will some day supplant the mongrel civilization of Spain and Portugal, and give uniformity of laws, language, manners, customs and measures to all the western world. The inch is mightier than the metre.

EDWIN R. GRAHAM.

THE PYRAMID BASE.

STRATHROY, ONTARIO, February 27, 1884.

CHARLES LATIMER, ESQ.:

My Dear Sir:—I have now arrived at a definite conception of the Great Pyramid, and have no fear of the work done by Petrie. On the contrary, we are very much indebted to him; his work has developed the *strong* and *weak* points, and has shown us where to work intelligently and with a certainty of obtaining positive results in perfect accordance with Prof. Smyth, and the formulæ of our Institute as given by Messrs. Dow and Skinner, the diagram of squares, circles and enclosed triangle of Mr. Latimer, and the astronomical theory I have recently put forth in the articles sent you, involving the two standard years of 365 and 365.2422 days. The work of Petrie has also furnished me with demonstrative evidence of a new order of my theory, that the passages are designed to represent sections of the zodiac, each inch representing one minute of arc in the zodiac or ecliptic. *But for the present, all our force should be spent on the base and external structure.* And, if an expedition is sent out, a special system of tests should be adopted in the triangulation to definitely settle leading points now known to the members of the Institute, and not known to Mr. Petrie, nor Prof. Piazza Smyth, nor any one who has hitherto worked on the Pyramid. *It is impossible now for an expedition to do otherwise than succeed.*

I have drawn out or plotted a working plan of the Pyramid base and structure raised thereon, with a system of triangulations worked thereon, from data furnished by Mr. Petrie's book, and I am sure that an expedition sent out by the Institute will come home triumphant with honors. I am *also positive* that the measurements or lengths of base given by Petrie are not *actual* measurements, but theoretical lengths only; and that the Institute, by adopting actual measurements, will come home with results that must take precedence of anything furnished by Mr. Petrie, and be regarded as more reliable, safe and *actual*.

In his working plan of the base I have laid down a simple system of measurements,

* I am aware that the Egyptian Government has adopted the metric system, but England has her hand on Egypt. It will never relax its grasp.

capable of popular expression and publication, that leaves no doubt as to the working method adopted by the architect in laying out the base. But lest I should write out an essay, I will stop just here, and send what I have written for your own private use.

Let me know when you get the book, and let me also warn you of its cheap and miserable binding.

Yours truly,

S. BESWICK.

The theory set forth in this article is based on the fundamental conception that the architect first laid out on the ground a theoretically perfect square base, whose four sides were each equal to 9139.87125 British inches in length, in agreement with the formula first constructed by Mr. J. H. Dow, of Cleveland, and with reference to the use of the British inch, as first discovered by Mr. J. R. Skinner, of Cincinnati.

The architect placed this standard, theoretical base due N. E. S. W., and made its orientation perfect by actual survey and plotting upon the bare rock itself: laying out its sides and angles as upon a table. Having fixed upon and determined his standard stations and limits, he placed upon the same spot the present pyramid, giving its northern axis a westerly variation of $5^{\circ} 12.66''$ from the true north of his standard base line, and giving its eastern axis a variation of $4^{\circ} 23.6''$ from the true east of his standard base. His theoretical square base was, therefore, perfectly oriented and plotted out upon the bare rock as a guide for the builders of the Great Pyramid during its erection, with the variations above named, and for reasons set forth in this article.

In my former article I gave reasons for believing that the base of the Great Pyramid was constructed with special reference to a square base of 9139.8712 British inches to each side, but that the sockets had been prepared with special reference to a base whose north and east sides were each 9131.05 British inches in length, and whose south and west sides were each 9125 British inches in length. The first gives a year of 365.59 days; the second gives a year of 365.2422 days, equal to the equinoctial or true year, and the last gives the ancient sacred year of the Egyptians of 365 days. I now propose to illustrate this conception.

The Great Pyramid, as a geometrical figure, is evidently an acute quadratic octohedron, and consists fundamentally of a

rhombic form of the east zone, and an equal and similar rhombic form of the north zone, whilst the two south and west zones are equal and similar rhombic forms to each other, but are different in size from those opposite thereto on the north and east face. Let two rhombic prisms cross one another at the level of the equator, with their longer diagonals parallel with the vertical axis of the Great Pyramid; let the line of their direction be closer to the axis running east and west than to the axis north and south, and let the deviation from true north be 5' west of north, so as to produce angles of $51^{\circ} 51' 14.3''$ at the equator, and $76^{\circ} 17' 31.4''$ at the terminal apex; the result will be the production of just such a geometrical figure as I have described above.

Let me illustrate the result, and test it by the admirable measurements of Prof. Piazzzi Smyth in 1865, and those made recently by W. M. Flinders Petrie in 1881. What would be the deviation, from true northwestward, required to alter the base side from 9139.8712 British inches, the side length of a perfect square base, to 9131.055 British inches, the representative of a true standard tropical and equinoctial year of 365.2422 days? $\frac{9139.8712}{2} : 45^{\circ} = 162,000'' :: \frac{17.632}{2} : 5' 12.66''$.

In other words, a difference of 8.82 British inches in the difference of length = $9139.8712 - 9131.0550 = 8.8162$ inches, would necessitate that everything at the Great Pyramid should trend *at its north end towards the west*, and the socket-sides of the base should deviate 5' 12.66'' from the true north. This is exactly what it does do—what actual measurements prove that it does do, and what theory requires and expects it to do. Prof. Smyth says:

“Everything trended at its north end, towards the west; the socket-sides of the base by 5 minutes.”—Our Inheritance, p. 349.

“The mean azimuth is 5' 16'' to the true north.”—‘Petrie’s Pyramids,’ pp. 38-41.

Or, by reversing the case, allowing 5' 16'' for a mean deviation westward from the true north, the statement of Mr. Petrie would absolutely require that the side of a square base = 9139.8712 would have to be changed into a side length equal to

9131.05 British inches. On page 125 Mr. Petrie gives the same deviation with probable error = $5' 16'' \pm 10''$. Now, the actual deviation, which this change of 8.8212 British inches requires, to make the length express the exact length of the standard year of 365.2422 days, would be exactly $5' 12.66''$ of arc. This is a very close result with that which both Prof. Smyth and Petrie give, being only a difference = .009 of a British inch. And yet Mr. Petrie allows a marginal error of $\pm 10''$, our difference being only $3.34''$, or one-third of the error allowed.

This deviation of $5' 12.66''$ west of the true north was part of the plan and design of the architect, and the special purpose he had in view was this, that he might convert the side of a perfectly square base into one that should express, in British inches, the exact length of a standard equinoctial year of 365.2422 days, with the fractional part of a year included; and that whilst the north and east sides of the base give a year of this length, the south and west sides of the base give the ancient sacred Egyptian year of 365 days only, by which their calendar was regulated.

Let us now take the southern side of the base and consider it in relation to the sacred year of the Egyptians, consisting of 365 days only, with a base on the south and west sides of 9125 British inches. And in order to test our standard square base, being equal to a square with sides equal to 9139.8712 British inches, we will take Mr. Petrie's own value of the deviation from a true east on the south side, with a line of 9123.9 British inches from socket to socket. The deviation given by Mr. Petrie is $4' 53''$ from the east. What would be the effect upon a side length of the base by a deviation equal to $4' 53''$? It would diminish the length of the base by 16.813 British inches, and reduce it from 9139.8712—16.813 = 9123.058 inches. In other words, it would make the length what Mr. Petrie found it to be by actual measurement, with a difference of .842 of an inch and a probable error of $10''$. But if the true length of side be regarded as being 9125 inches (and this is very nearly Mr. Petrie's mean length, 9125.9 inches), the actual deviation ought to be

4' 23.6'', instead of 4' 53''. But some little should be allowed for warping.

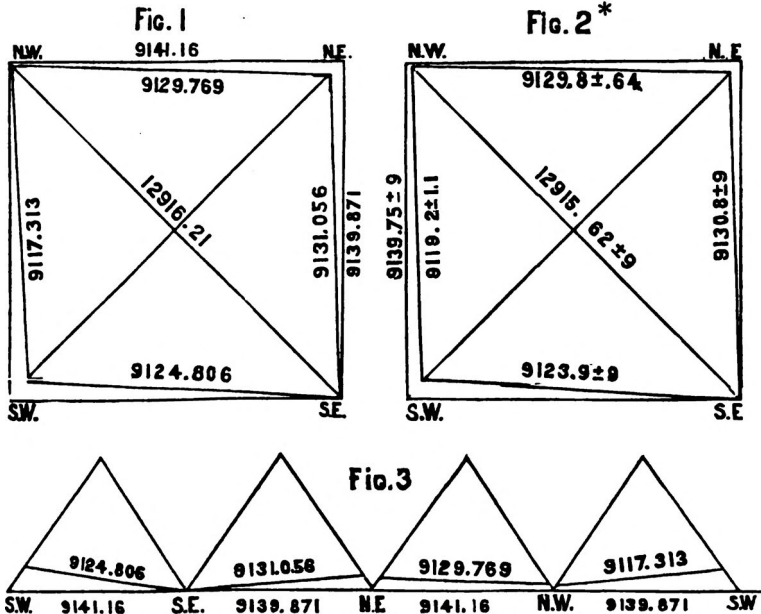
These remarkable coincidences in results prove clearly that the architect designed the Great Pyramid to represent a building *perfectly oriented*, with its horizontal axes due north and south, east and west, and took this ideal building as his foundation plan. He then determined that his future building should have a base so oriented as to represent the two standard years then in active operation, or became so afterwards—the sacred calendar year of 365 days and the standard actual year of 365.2422 days, whilst the north and east sides should represent and express, in actual British inches, the standard astronomical year of 365.2422 days. And to do this, the horizontal axis on the north side was made to deviate 5' 12.66'' from the true north, westward, and thereby reduce the N. and E. sides to a length = 9139.055 inches. whilst the horizontal axis on the west deviated 4' 23.6'' from the true east, thereby reducing the S. and W. sides to a length of 9125 inches.

But the principal effect of the warping is manifest in the western base side, where the shortest length is found. Mr. Petrie admits considerable warping in the S. W. angle of the masonry, and Prof. Piazza Smyth gives a mean warping, trending or tilting of 6' 6'' in the east and west walls, towards the south, in the king's chamber. But the base has a similar tilt or deviation in the southwest to the amount of 1' 43.3'', making a total deviation of 6' 6'', as seen in its effect upon the western base. For instance, Mr. Petrie makes the western base length to be 9119.2 inches from socket to socket. What would be the effect of giving the building a western base of this length, and how much variation would be required? The answer is easily given, and should be satisfactory. Assuming the standard square base to be 9139.8712 inches in length to each side, the deviation from a true east and west would be 6' 6.38''. Such a deviation would require the western base to be exactly 9119.2 inches in length—the length given by Mr. Petrie in his published work. The true length should be 9125 inches, with a variation of 4' 23.6''. Anything beyond these values is in excess of the original de-

sign, and a deviation from the true structure of this geometrical and architectural wonder of the ancient and modern world.

This discovery of the Pyramid's base, and its symbolic structure and design, will form a working hypothesis such as we have never had before, based on well established and duly authenticated measurements, and enable us to proceed with our researches to a more complete and advanced conception of the refined and mysterious knowledge possessed by the age which produced this ancient pile of masonry so full of mystery.

We may now take another step forward in our exposition of this remarkable discovery of the true form of the base. And in our critical examination of Mr. Petrie's very elaborate and excellent work, now under review, we will consider the reason why the architect has placed the sockets at different heights, and at different distances from the centre, the highest socket being nearest the centre. At the same time we now propose to submit our own discovery of the true theoretical form of the base to actual test and numerical proof.



* In Fig. 2 the decimal in each case after the plus or minus sign should be .65.

Why were the sockets placed at different heights? We will go round all the four sides of the base and test the measurements and heights of the sockets, thus putting our theoretical discovery and Mr. Petrie's measurements to the severest critical test. We will begin with the S. E. corner of the base.

(1.) EAST SIDE WITH ITS S. E. AND N. E. SOCKETS.

The architect has given the northern axis a westerly trend of $5' 12.525''$ from the true north. This would diminish the eastern base 8.8162 inches, and make it $9139.8712 - 8.8162 = 9131.0550$ inches in length. I have already proven this fact. But the architect would double this factor, and thus raise the height of the N. E. socket so that it would have a horizontal plane of only 9122.2388 inches, or $9139.8712 - 17.6324 = 9122.2388$ inches. Because the line forming the Pyramid's base must be a diagonal or mean length between the horizontal plane of the S. E. socket and the horizontal plane of the N. E. socket. And the exact height which this theory demands is 11.2456 inches of elevation. Mr. Petrie gives 11.4 inches for height and 9130.8 for length of base. Our estimate, although within the .9 of admitted error, is more theoretically correct than Mr. Petrie's estimate. The eastern base of the Great Pyramid is, therefore, a representative of the standard equinoctial or tropical year of 365.2422 days.

(2.) NORTH SIDE, WITH ITS N. E. AND N. W. SOCKETS.

The standard length of the northern base, like the eastern base, is also 9131.055 inches. But the architect made this the most horizontal of all the four sides, with but little difference in the height of the two sockets. So, taking 9131.055 as the length of the lower base, he raises the N. W. socket 7.1 inches, and thus gives it a truly horizontal plane, whose length is 9128.6666 inches. The diagonal or mean plane would be 9129.8608 inches, and this would be the builder's length. Mr. Petrie gives 9129.9 inches, without any closer fraction. Here, again, our theory is more accurate than Mr. Petrie's excellent measurements. The theoretical base in the architect's mind is

evidently 9131.055 inches, which represents the standard year of 365.2422 days.

(3.) WEST SIDE, WITH ITS N. W. AND S. W. SOCKETS.

This brings us to a consideration of the western face of the Pyramid. And here the standard theoretical value of the base changes from 9131.055 to 9125 inches. The latter is a representation of the ancient sacred year of 365 days. To make this change the S. W. socket is raised more than double the height of the N. W. socket. The latter, as we have seen, is 7.1 inches above the S. E. socket, and the former, or S. W. socket, is 16.813 inches high. At this height the horizontal plane would be 9113.6 inches in length, and the standard base plane 9125 inches. Between these two planes the architect has placed the diagonal mean line 9119.3 inches in length, joining the N. W. with the S. W. socket. Mr. Petrie gives the height 16.9 inches for height of socket, and 9119.2 for length of base, there being little or no difference between us. But the factor 9131.055 has now been changed to 9125 inches, as the representative of the ancient sacred year.

(4.) SOUTH SIDE, WITH ITS S. W. AND S. E. SOCKETS.

We now come to the south face of the Pyramid. We have shown, in a former article, that the core pyramid trends from the true east $4^{\circ}23.525''$, which diminishes the southern base side and makes it 9125 inches exactly. But the case is the same with the southern face as with the eastern. The socket has been placed at the S. W., so as to lift the S. W. end of the southern base to the height of a horizontal plane, equal in length to 9122.2388 inches, although the standard length is 9125 inches. The diagonal or mean line between these two planes is 9123.619 inches. Mr. Petrie gives $9123.9 \pm .9$ inches. He also gives 9122.5 for the value of the Royal Engineer's survey.

(5.) THE STANDARD SQUARE BASE NOT BUILT.

Something may now be said in relation to this standard theoretical base, which was evidently plotted on the spot whereon

the Pyramid was to be built and laid out as to its principal corners, and perfectly oriented, with stations fixed by which the builders could be guided in building the stone edifice, which had to be erected within the site of this standard theoretical base.

The south side was evidently run out to the full length and width of this standard theoretical base, to a station distant from the S. E. corner 9139.8712 inches, or double the distance of the difference between 9139.8712 and 9131.055, equal to $8.8162 \times 2 = 17.6324$ inches, or the difference between the actual length of the south base 9122.2388 and 9139.8712 inches. Mr. Petrie says, p. 206, "This is stated (Royal Engineer's survey) as 9140. Now, the outer edge of the socket-block at the S. W. is 17.5 inches *beyond the drawn line which defines the socket*, and is therefore about 9140 *from the S. E. corner*." This is the outer theoretical standard base, which will be found to be perfectly oriented, being due N. S. E. W. The trend towards the west affects the southern end of the axis by exactly double the amount as stated above, to the extent of 17.6324 inches. Mr. Petrie makes it 17.5 roughly, and the length roughly at "about 9140 from the S. E. corner," instead of 9139.8712 inches.

So again, with the north end of the east base. The trend of $5' 12.525''$ diminishes the length of the east base, as we have seen, by 8.8162 inches, or from 9139.8712 to 9131.055 inches. The constant complaint of Mr. Petrie arises out of this fact. He says the foot of the casing, on all sides, was within the lines of the sockets. Exactly what our theory leads us to expect; for the outer lines form the standard theoretical square, whose sides are equal, and 9139.8712 inches in length, and perfectly oriented, its northern axis being exactly in the meridian without any variation.

In conclusion, we have been highly pleased with the tests to which we have submitted this work, and we cannot speak too highly of its real intrinsic merits, for its careful and extremely accurate measurements, and the evident effort which pervades the entire book to make the results attain a high order of excellence, and worthy of being regarded as one of the most complete—if not the most complete—expositions of the Pyramids

of Egypt that has ever been published. It ranks high as a standard work for numerical detail and data, and grouping of leading theories and facts, and will be extensively used as a work of reference, for its varied and elaborate measurements, and the reliability of its data, for some time to come.

S. BESWICK.

THE PILLAR OF WITNESS.

In these days there is heard among us an oft-repeated question: what *Scriptural evidence* can be produced to show that the Great Pyramid is the '*Pillar of Witness*,' as recorded in Isaiah, chapter xix, verses 19 and 20, which reads: "In that day shall there be an *altar to the Lord* in the midst of the land of Egypt, and a *pillar at the border thereof, to the Lord*, and it shall be *for a sign* and *for a witness* unto the LORD of hosts in the land of Egypt." An *altar* is a mount, or elevated place. A *pillar* is a pile, or heap—a monument to commemorate any remarkable transaction. That the Great Pyramid of Jeezeh is such an altar and pillar is too well attested for any one to deny; and that it stands *in the midst* of the land of Egypt, and also at the *border* thereof, was fully demonstrated by Mr. Henry Mitchell, chief hydrographer of the United States Survey. Now that we have found this great pillar standing in the specified place, the question is, *how* can it be *for a sign* and *for a witness* unto the LORD of hosts?

A *sign* is something by which *something else is shown*. And to be *a witness* unto any one is to furnish evidence or proof on his behalf.

It has been found (by very careful and thorough examination) to be built of rock of different kinds, arranged in such a way as to manifest great wisdom and design; and to have within the depths of its solid masonry, apartments with passages leading to them of exquisite workmanship, and in measures of such wonderful proportions and harmony of perfection as to manifest a knowledge superior to that possessed by man. Its speech,

though silent, is not unlike that of the stars in the arch of night. Surely it is a *sign* pointing to the handiwork of God. It is seen that some of its passages are descending, and some are ascending, and are in sections or divisions whose measures have such an agreement with the Bible history of man through past ages, even to the present time, as to prove it was designed by an infinite mind.

If in the Scriptures we read the number of years that elapsed from Adam to Noah, to the flood, to Abraham, to Isaac, to Jacob, the exodus, and to Christ, and find the same expressed in measures in the Great Pyramid and signally marked, we have reason to believe the same one who gave us his word in the Scriptures, has given us the corresponding evidence that we find in the Great Pyramid. If in this building we find the standards for weighing the earth and measuring the waters, the distance to the sun and the number of years occupied in the precession of the equinoxes, and very many other measures beyond the power of finite man to conceive, all in harmonious and perfect proportions, we must know it came from God. We read in his word by the prophet Isaiah, (xl, 12)—“He has measured the *waters* in his *hand*, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance.” In Proverbs we read, (xvi. 11) “A *just weight* and *balance* are the LORD’S. *All* the weights of the bag are *his work*.” And to Israel he said (Deut. xxv. 15), “Thou shalt have a perfect and just weight, a perfect and just measure shalt thou have; that thy days may be lengthened in the land which the LORD thy God giveth thee.” We have also the measures distinctly specified in the dimensions of the tabernacle and in the ark of the covenant, which we are told are the shadow of heavenly things. We read, Moses was admonished of God (when he was about to make the tabernacle), (Heb. viii.) “See, saith He, that thou make *all things* according to the pattern showed to thee in the mount.”

Now if we find these measures are the same as in the Pyramid, is it not most convincing proof that the LORD was the author of them both? Who shall rise up and deny it? or at-

tempt to substitute another system of weights and measures in its stead? Let us not be deceived by the fascinating sound of "*decimal system*," while those who advocate the system admit it is imperfect in its adopted unit for standard. The LORD speaks by the prophet Micah (Micah, vi. 11), "Shall I count them pure with the wicked balances, and with the bag of deceitful weights?" And in Proverbs it is said (xi. 1), "A false balance is abomination to the LORD; but a just weight is his delight." This great Pillar of Witness stands in Egypt, having in it but one piece of furniture, and that one piece a box, or coffer, of unsurpassed workmanship, cut out of one solid piece of enduring rock, and having the same dimensions as the ark of the covenant. Truly the Great Pyramid *is* a witness to the LORD of hosts. Well may we take up the song of Moses (Deut. xxxii. 3), Ascribe ye *greatness* unto our God. *He* is the Rock, his work is perfect, for *all his ways* are judgment, a God of truth and without iniquity—*just and right* is he."

"*Every good gift and every perfect gift* is from above, and cometh down from the Father of lights, with whom is no variableness, neither shadow of turning." In the light of this word, let us consider how much money, labor and time have been expended by men of science for many years in efforts to obtain a perfect measure of the distance to the sun from the earth. Now, after all is done, only one man of the many has been able to come to a decision that is satisfactory, and that one agrees with that found at the Great Pyramid. We might ask: What relation have the *Pleiades* to our earth? Something surely—that God should talk with Job concerning them; and that by the mouth of the prophet Amos he should invite Israel in these words: "Thus saith the Lord, seek ye me and *ye shall live*. Seek *him* that maketh the *seven stars* and Orion, and turneth the shadow of death into the morning."

In the measures of the Pyramid is found the length of time in which the sun makes his circuit around *these same seven stars*, or the years of the precession of the equinoxes. The same great truth is uttered by the Psalmist: "The *heavens* declare the glory of God and the firmament sheweth his handiwork. Day *unto day* uttereth speech, and night *unto night* sheweth

knowledge. There is *no speech nor language* where THEIR voice is not heard. Their line (or procession) is gone out through all the earth, and *their* words to the end of the world. *In them* hath he set a tabernacle for the *Sun*, which is as a bridegroom coming out of his chamber, and rejoiceth as a strong man to run a race. His *going forth* is *from the end* of the *heaven*, and his *circuit* unto the ends of it." Who could have marked the measure of his circuit in the Pyramid but the LORD himself? Therefore it is a witness to the LORD. The one passage in the Pyramid called the 'grand gallery' on account of its great height, is seen to represent the Christian Dispensation. In Luke we have a wonderful announcement: "There were in the same country *shepherds* abiding in the fields, keeping watch over their flocks by night, and lo, the angel of the LORD came upon them, and the glory of the LORD shone round about them, and they were sore afraid; and the angel said unto them, '*Fear not*, for behold I bring you *good tidings of great joy*, which SHALL BE to *all people*; for unto YOU is born this day, in the city of David, a *Saviour*, which is *Christ the Lord*.'" This event is marked in the Pyramid by the commencement of the glorious, grand gallery.

His resurrection is also marked by a bursting forth of the rock at the measure of his years, and the length of this gallery measures the years to our present time—all recorded in this stone pillar so long ago. Is it not a witness to our God that *he* is God, "who hath declared the end from the beginning, and from *ancient times* the things not *yet done*?"

Other passages and chambers continue onward still further, whose interpretation is yet unknown, and which cannot yet be fully understood by man. When Moses desired to look into the future, God said to him (as one translator has it): "Thou shalt see what is behind me, but that which is before me shall not be seen." Hence, as these things were written so long ago in the Great Pyramid, it witnesses to the *Lord of hosts* that he is God.

In these days of infidelity, when men are saying the Bible was written by men without inspiration from God, that it is a *fable*, a drama, here rises up this pillar of witness, and says: I

was built and sealed up long before the Bible was written, but here is written the same things recorded in the Bible, witnessing to the LORD of hosts that *he* is *God*, who says: "Is there a God beside ME? I know not any;" and again, "Remember the former things of old, for *I* am *God*, and there is *none* else. *I* am *God*, and there is none like me, declaring the end from the beginning, and from ancient times the things that are not yet done, saying, my counsel *shall stand* and I will do *all my pleasure*." Ascribe ye greatness unto our God; *he* is the rock, his work is perfect.

ANGIE DAMON.

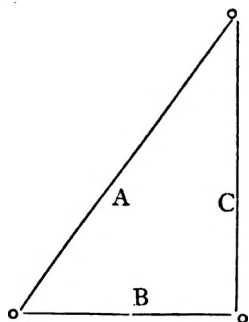
PYRAMID NOTES FROM THE ANTIPODES.

Your letter of the 10th of December at hand, also five numbers of the INTERNATIONAL STANDARD, viz: March to November inclusive, for which I hasten to thank you. I find much that is interesting and suggestive to me in this publication and shall be glad to become a subscriber to it, and if you like, an occasional contributor, although, perhaps, in respectful and healthy antagonism. Please continue to send me the work, and I will forward the sum of four dollars to cover the cost of the numbers already received and the subscription for the year 1884.

I shall look forward with interest to the critique upon my book by Mr. Jacob M. Clark, and to Lieut. Totten's paper upon the pentalpha.

Your offer to me to become a member is, I regret to say, beyond my power to accept. I differ with your Society in some things. I am not, for instance, prepared to nail my colors to any standard, such as that the π ratio is the leading principle of the principal pyramid of the Gizeh group.

You are wrong in your calculation of the angle of the Pyramid Cheops, according to the pentalpha; it is not $51^{\circ} 49'$, but $51^{\circ} 49' 49''$, it is thus:



Let A = apothem.

B = base half of

C = altitude.

$$(A + B) : A :: A : B$$

i. e. A and B are in mean and extreme ratio; and

$$A : C :: C : B$$

i. e. The altitude is a mean proportional between apothem and half base.

Arithmetically, $A = 2$

$$B = \sqrt{5-1}$$

$$C = \sqrt{A \times (A+B)}$$

$$\text{also } A + B = \sqrt{5+1}$$

whence may be got the figures representing the lines.

$$A = 618034$$

$$B = 381966$$

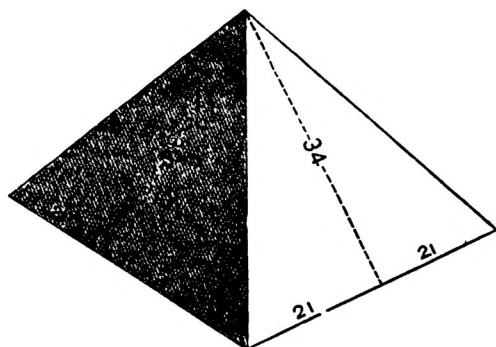
$$C = 485868$$

whence \angle at base = $51^\circ 49' 49''$

A pyramid on these proportions with the base of 761.65 feet assumed by Piazzi Smyth, would be 484.41 feet high, or exactly six inches lower than the height assumed for the Pyramid by Piazzi Smyth, viz: 484.91 feet.

But I never claimed that the above was the building ratio of the Pyramid Cheops. Refer to my Pyramid 'Solution,' page 21, figure 6. There you find the following diagram given as the building ratio, viz: apothem 34 to half base 21. Here the angle is $51^\circ 51' 20''$ (pretty close to your π , being a result of 3.1414 for twice the base divided by the alti-

tude) and if you make the base of the above pyramid 761.65 feet, its height will be exactly 484.91 feet, agreeing ex-



actly to the height and base accorded to Cheops by Piazza Smyth as a π pyramid.

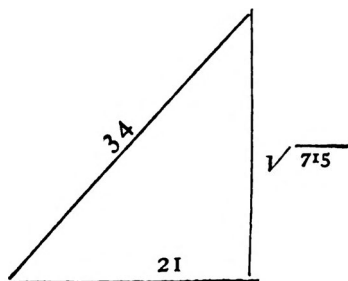
Now, since the ratio of this Pyramid as built, is proved undoubtedly by Vyse's casing stone, and other proofs (all of which you claim for π), to be 34 apothem to 21 half base, I fail to see why it should be called a π pyramid; or an approximate to a pentalpha pyramid.

My calculations for my last quoted results, are as follows:

$$\text{Apothem} = 34$$

$$\text{Half base} = 21$$

$$\therefore \text{Altitude} = \sqrt{715}$$



$$\therefore (21 \times 2) : \sqrt{715} \quad \begin{matrix} \text{feet.} & \text{feet.} \\ \hline \therefore 761.65 : 484.91 \end{matrix}$$

However, since the ratio of 34 apothem to 21 half base is within $3''$ + of the angle that your Society claims for the Pyra-

mid, I, as a practical builder, have no cause to complain, we agree quite near enough in the shape of this pyramid for you to graciously acknowledge the truth of the builder's ratio which I have ascribed to it.

Mr. Petrie, I see, supports my ratios too, as well as Mr. Smyth by his figures; for, in his book on the 'Pyramids and Temples of Gizeh,' he gives the following angles for the 1st, 2d, and 3d Pyramids respectively, viz:

1st, $51^{\circ} 52' 0''$
 2d, $53^{\circ} 10' 0''$
 3d, $51^{\circ} 10' 0''$

My ratios of apothem to half base for three pyramids being (see 'Solution,' p. 23)

1st, 34 to 21
 2d, 33 to 20
 3d, 32 to 20

My angles are, therefore,

$51^{\circ} 51' 20''$
 $52^{\circ} 41' 41''$
 $51^{\circ} 19' 4''$

Looking at the utter impossibility of getting at the angles on the ground now the casings are destroyed, I consider Mr. Petrie's measures a near approximation to my angles theoretically obtained.

I have refrained in my book from entering upon the consideration of the inner chambers of the Pyramid, but I am glad to find that your Society is proving the truth of my prophecy at page 80 of my 'Solution,' "That the very accurately and beautifully worked stones in the walls of the king's chamber of Cheops, may be found to indicate the ratios of the rectangles formed by the bases and perpendiculars of the triangulations used by the old surveyors—that on these walls may be found, in fact, corroboration of the theory that I have set forth."

The interesting paper of Mr. W. Searles, in the March num-

ber of the STANDARD, called "The proportions of the king's chamber," goes a long way to prove the above.

The king's chamber in the Pyramid Cheops is a solid, practical demonstration of the formula for constructing primary (or whole sided) triangles, generally described by me in my 'Solution' pages 65 to 73, and of which the simple arithmetical formula is given on page 72.

In this chamber let

$$\begin{aligned} A &= \text{--- width} = 2 \\ B &= \text{--- end diagonal} = 3 \\ C &= \text{--- length ---} = 4 \\ D &= \text{--- solid diagonal} = 5 \\ E &= \text{--- height} = \sqrt{5} \\ F &= \text{--- floor diagonal} = \sqrt{20} \\ G &= \text{--- wall diagonal} = \sqrt{21} \end{aligned}$$

The original primary 3, 4, 5, is here found in B C D and its satellite 2 — 1 in C and A.

The 20, 21, 29 triangle *is indicated* by F and G. Now the satellite 5, 2, of the 20, 21, 29 triangle, is found represented by D and A, for the solid diagonal and end width of the parallel-opipedon answer in the solid, to the sine and versed sine in the flat, of the primary formed by sine, cosine and radius.

Therefore, by formula p. 72, of my 'Solution,'

$$\begin{aligned} D^2 + A^2 &= 5^2 + 2^2 = 29 \\ D^2 - A^2 &= 5^2 - 2^2 = 21 \\ D \times 2A &= 5 \times 2 \times 2 = 20 \end{aligned}$$

The beauty of this solid demonstration is not more than the flat working, but it is more striking; either way the corresponding triangles are equally well indicated.

Chambers of the same class may be constructed from any primary or whole-sided triangle, and beautiful sets produced for insertion in sets of tables and showing the connection of these wonderful trigonometrical aids. Thus, taking the same letters that I have placed opposite the dimensions of the king's cham-

NOTE.—No doubt by comparing end diagonal, solid diagonal, and length of other chambers in the pyramids, you may find *other* primary triangles.

ber, we can evolve, by prosecuting the theory triangles, and chambers, as follows:

	King's Chamber.	Another—The Theoretical.	Another—The Theoretical.
A	2	9	400
B	3	21	760
C	4	20	522
D	5	29	922
E	$\sqrt{5}$	$\sqrt{319}$	$\sqrt{112484}$
F	$\sqrt{20}$	$\sqrt{522}$	$\sqrt{737600}$
G	$\sqrt{21}$	$\sqrt{760}$	$\sqrt{690084}$

Thus, as the 3, 4, 5, indicates the 21, 20, 29, so does the 21, 20, 29, indicate the 760, 522, 922, and that in its turn indicates the 690084, 737600, 1010084 whole sided triangle.

In the same way, suppose the pyramid builders had wished to display the 3, 4, 5 triangle in a chamber of another form, they would have done it as follows, viz :

$$\left. \begin{array}{l} A = 1 \\ B = 4 \\ C = 3 \\ D = 5 \\ E = \sqrt{15} \\ F = \sqrt{10} \\ G = \sqrt{24} \end{array} \right\} \text{indicating the 10, 24, 26 triangle.}$$

In this you will observe that C and A = 3, 1 = the satellite to the 3, 4, 5 triangle, with 3 as a base, as in the king's chamber. 4, 2 (2 — 1) was the satellite to the 3, 4, 5 triangle, with 4 for a base; and from these a series can be evolved, viz : the 10, 24, 26 triangle, and the 52, 675, 677, &c., &c.

The above is a very pretty geometry, and in pursuing it all sorts of beautiful combinations arise, throwing light on the foundation of primary triangulation, or right-angled, whole-sided trigonometry.

You ought to be well satisfied, after Mr. Searles' paper on the proportions of the king's chamber, and after pursuing it further, that my hypothesis is correct, that the 3, 4, 5, and the 20, 21, 29 triangle were the main angles of the Gizeh Pyramid builders, the more especially as in the inclination of the galler-

ies may be found the angles of various primary satellites = $\frac{1}{2}$ < of primary.

I think you are very "rough" on Mr. Petrie—I never read a less *prejudiced* book—the prejudices appear to me to lie with *nous autres*, whom he calls the "theorists," and very properly too, we are pure theorists, but I hope that some of our theories are correct.

I note your remarks about the need for exposing the secret love of the Freemasons—perhaps it is time, perhaps not. I have given a few broad hints in my book, but, the fact is, that there are no masons who are not deeply versed in geometry who have any idea to what glorious mysteries their ceremonials point. I am a mason of the 30th degree and have studied the craft deeply, in so far as it is connected with geometry and numbers.

I may admit, without in any way committing a breach of masonic confidence, that our mysteries *distinctly point* to the preservation of the pentalpha as *the most sacred of symbols*, and to the fact that, in the erection of all great and superb edifices it was the custom to take particular care to deposit the working plans every night securely in a place of safety; whence you may be perfectly justified in the assumption, that the working plans of the Great Pyramid itself may yet be found upon intelligent search, securely deposited within the Pyramid.

R. BALLARD.

MATHEMATICAL ACCURACY.

In some of the communications sent for publication in this Magazine, distinction between pure and mixed mathematics does not appear to be carefully recognized. Statements are made about the mathematical accuracy of measures and lines, where the term instrumental accuracy should be used. Exactness is affirmed where only approximation is possible. Pure mathematics, or the science of numbers, the formulæ and processes of algebra, the axioms and demonstrations of geometry, deal with mere ideas or conceptions of the mind. A line in pure mathematics has no existence. It is the mind's conception of length or distance without breadth or thickness; it is only a thought, an idea, and, in fact, unmakeable. The circumference of a circle is the mind's conception of a line equally distant from one point, in one place. A circle is unmakeable; it can be found neither in art nor in nature. Approximations can be made to a line or a circle; but the finest line in photography has breadth; it does not answer the mind's conception of pure lines.

Now, in the discussion of pyramid planes and lines, the most that can be said of them is that they are approximations to the ideal—very close, no doubt—perhaps with an error of only a hundredth of an inch, but the error is there.

Mixed mathematics is an application of mathematical conceptions to physical objects. It determines what the physical forms and proportions would be if they coincided with the mathematical conceptions. But, in the very highest art, the coincidences are nothing but approximations. The coincidences may be so close and so numerous, and so related to one another, that they will really exhibit the intention of the construction. In common speech, an ellipse, is quite different from a circle; yet the ellipse approximates the circle as its two diameters approach equality till the difference is not instrumentally

measurable. A circle circumscribed about an ellipse has but two points coinciding with the ellipse. The moment a third point of coincidence occurs, the ellipse becomes coincident with the entire circumference of the circle. Hence where the number of instrumental coincidences increases between the different lines of the same structure, we can read the intention of the architect with as much certainty as we do the purpose of an author in the relationship we discover between the several chapters of his book. Beyond all doubt, multitudes of instrumental coincidences exist in the Pyramid. Their value rests wholly upon the question, were these coincidences designed or undesigned. Do they mean anything? They may be only the result of geometrical relations. If so, they exhibit the architect's knowledge of geometry and skill in workmanship. But if the coincidences go beyond geometry and touch the physical world and astronomical facts and relations and historical records, there is an *a priori* probability that such coincidences and series of coincidences were designed; and consequently the proof that they were not designed is a burden that rests upon him who says they were not designed.

There is almost no end of the curious and interesting results of geometrical relations discoverable in the Pyramid within the limits of instrumental error. It is a geometrical structure. It is a grave problem to undertake to interpret its geometry and apply it to the solution of the problems—the physical world. Some men rush into it with amazing boldness. The very joints of its masonry ought to be enough to warn thoughtful men that this is no ordinary building. They would not enter the great cathedrals in that fashion, yet there is no workmanship in the cathedrals equal to that of the Pyramid. But the cathedrals are rich in historical associations, and therefore are worthy of reverence. And shall we have little respect for the Pyramid because we are ignorant of its living associations? It is a witness of long standing. The perfection of its workmanship, if nothing else, should stimulate us to investigate its meaning. Whoever may happen to pick up a fragment of the truth, very unwisely claims to have found the whole truth and nothing but the truth. Many authors have written history, but how much is chaff?

Criticism will yet sift Pyramid theories even as doubt sifts written history, to bring to light truth and truth only. It would be well if all Pyramid students, who believe or even think it possible that the Egyptian monument is a product divine or semi-divine, would be less bold in their assumptions, more content to be pupils, and less ambitious to be professors.

H. G. WOOD.

“PROVE ALL THINGS.”

Many Pyramid students have been led into error by accepting on trust the assertion, too often found in our publications, that the arris lines of the Great Pyramid (its sloping edges from corners of its square base to its apex) approach the axis of the Pyramid ten feet for every nine feet of rise. This ratio is only approximate, and the discrepancy between this and the height : perimeter :: radius : circumference proportion of the Pyramid is so great that the combination of both in a single geometrical figure was surely not the intention of the architect. For if the two propositions harmonize, and are embodied in the Pyramid, we shall then have the general proposition : The perimeter of the base of a π pyramid equals the circumference of a circle whose radius is 9-10 of the half diagonal of the base. But this proposition cannot be true, for if it were correct—Let s = side of square base, then $\sqrt{2}(\frac{s}{2})^2 \times 9-10 \times \pi = 2s$. Reducing this gives $\pi = \frac{20\sqrt{2}}{9} = 3.142 +$, which is inadmissible. Hence let us write in large letters so that every one may take notice :

THE SO-CALLED 10 TO 9 SLOPE OF THE CORNERS OF THE GREAT PYRAMID IS A FALSITY.

J. H. DOW.

MANUFACTURE AND PROPORTIONING OF WEIGHTS AND MEASURES.

TO ALL WHOM IT MAY CONCERN :

Be it known that I, Charles A. L. Totten, of the Army of the United States, have discovered and invented a new and useful improvement in the mode of making and proportioning Weights and Measures ; and I do hereby declare the following to be a full, clear, and exact description of the same :

This invention is particularly concerned in the discovery of the proper aliquot parts by means of which a system of weights and measures, similar to those known as "troy," "apothecary," "avoirdupois," "wine-measure," "dry measure," "imperial," and, in fact, all Anglo-Saxon weights and measures, may be improved, perfected, and mutually connected with each other, for the purpose of better reduction and facility in passing from one system to another. The adoption of my system will change all the values now involved and known as "grains," "drams," "ounces," "pounds," "gills," "pints," "quarts," &c., (more or less,) in such a way as to render them new amounts. The changes, however, are of very small quantities from the practical standpoint of every day life, and while not calculated to involve inconvenience, if ever adopted, are still such as to be radical from a scientific standpoint, in that they look toward unifying, under certain new and essential formulæ, things which now are not so.

I will now describe my discovery, after which I will be able to point out more clearly how much and how little I differ from the present systems.

The basis of my system of weights and measures is a cubic inch of material, whose density shall be 5.7 times that of pure water at mean earth temperature and pressure. For the purposes of correlating the various systems now in use, I have discovered that such a quantity of material—(1 inch)³ at 5.7 pure water at earth's mean temperature and barometric pressure should be subdivided into exactly 1,536 elements, which I shall denominate "grains." These elements correspond very closely with what have hitherto been termed "grains" in Anglo-Saxon and other weights and measures; but they differ from them essentially, in that they are a shade less, in the ratio of about, (in cubic inches of pure water, &c.): my grains equal .0037109375. (exactly); present grains equal .00395735 $\frac{1}{2}$. I furthermore propose to subdivide my "unit cube" into certain other ultimates of still less dimensions, such that there shall be exactly 2,000 thereof contained therein, and which have no counterpart in the present Anglo-Saxon measures of weight. I shall call these "ultimates," because I can conceive of no smaller denomination for purposes of weights ever being necessary as a thing of special "name." I will again emphasize the fact that in my unit cube there shall be (at mean temperature, taken for the present at 68° Fahrenheit, and pressure taken at 30" barometer) exactly 1,536 grains and 2,000 ultimates.

I will now define and fix absolutely what I mean by a "grain" and an "ultimate."

My ultimate shall exactly equal .00285 cubic inch of pure water at mean temperature (68° Fahrenheit) and 30" barometer, or be 1-2000 of such a cube as I have above described.

My grain shall equal exactly 125-96 of an ultimate, equal .0037109375 (exact) cubic inch of pure water at mean earth temperature and pressure.

I now declare that what I shall employ and denominate as the "unit ounce weight" shall consist of 480 of my grains or of 625 of my ultimates, or, in other words, shall equal

in weight exactly 1.78125 cubic inch of pure water at mean temperature and pressure. When I say "exactly," I mean it literally. There are, for instance, no more figures after the 5 in the number (1.78125) just employed. The foregoing values being fixed and constant, I intend to rectify Anglo-Saxon weight and capacity measures thereby. For instance, my avoirdupois pound is to consist of 16 of the above unit ounces, my troy and apothecary pounds of 12 such ounces; and I intend to introduce one other system of weights, which I shall designate as "standard weight," in which the pound shall be 10 such ounces. These various weight-measures, as rectified by the above constants, will therefore stand as follows, in which it will be noticed that while I preserve, as I of course intended in rectifying the system, the terms now in use, I have necessarily altered all their values, and added the ultimate as a still lower subdivision. Since I claim this as an entirely new system, it must be constantly borne in mind that as my ultimate, grain and ounce are different by a shade from the present grain and ounce, my whole scheme of weights and the capacity measures, hereinafter to be shown as resulting from them, must correspondingly vary, and must therefore be new, whatever may be its essential value for future use among men.

Now, my tables are as follows :

TROY WEIGHT.

24 grains—1 pennyweight= $31\frac{1}{4}$ ultimates.
 20 dwt.—1 ounce=480 grains=625 ults.
 12 oz.—1 pound=240 dwt.=5,760 grs.=7,500 ults.

Upon its surface the above table, save in the use of the additional ultimates, does not appear to differ from troy weight as given in any book of tables. This is because I preserve all the terms and the form of the old system. This is one of the chief merits in the value of my discovery, that, while by my system the weights now in use become absolutely perfected, no confusion can result in their adoption.

APOTHECARY WEIGHT.

20 grains—1 scruple=26 1-24 ults.
 3 scruples—1 dram=60 grs.=78 $\frac{1}{4}$ ults.
 8 drams—1 ounce=24 scruples=480 grs.=625 ults.
 12 ounces—1 pound=96 drs.=288 scru.=5,760 grs.=7,500 ults.

Similar remarks are in order relative to the above table.

AVOIRDUPOIS WEIGHT.

30 grains—1 dram=39 1-16 ults.
 16 drams—1 ounce=480 grains=625 ults.
 16 ounces—1 pound=256 drs.=7,680 grs.=10,000 ults.
 28 pounds—1 quarter=448 oz.=7,168 drs.=215,040 grs.=280,000 ults.
 4 quarters—1 cwt.=112 lbs.=1,792 oz.=28,672 drs.=860,160 grs.=1,120,000 ults.
 20 cwt.—1 ton=80 qrs.=2,240 lbs.=35,840 oz.=573,440 drs.=17,203,200 grs.=22,400,000 ults.

In the avoirdupois table the present form and skeleton are preserved, save that the effect of my discovery is to rectify the form in one particular—namely, 30 of my grains equal 1 dram, while in the present statute tables 27.34375 of the old Anglo-Saxon grains go to form the dram. My system thus clears the most important or commercial weight of its awkward fractional commencement, besides making its ounce, grain, and ultimate of the constant or unit value of all the other tables.

STANDARD WEIGHT.

10 standard grains—1 standard scruple=13 1-48 ults.
 4 standard scruples—1 standard dram=40 grs.=52 $\frac{1}{4}$ ults.
 12 standard drams—1 standard ounce=48 scr.=480 grs.=625 ults.

10 standard ounces—1 standard pound=120 drs.=480 scr.=4,800 grs.=6,250 ults.
 (4 pounds—1 quart. wt.)=480 drs.
 (2½ qt. wt.—1 stone)=10 lbs.=&c.
 10 standard pounds—1 standard stone=100 oz.=1,200 drs.
 (4 stone—1 sack wt.)=40 lbs.=400 oz.=4,800 drs.
 (2½ sk. wt.—1 quintal)=100 lbs.=&c.
 10 standard stone—1 standard quintal=100 lbs.=1,000 oz.=12,000 drs.
 (4 quint.—1 wey)=40 st.=400 lbs.=4,000 oz.=48,000 drs.
 (2½ weys—1 thous. wt.)=100 stone=&c.
 10 standard quint.—1 standard thous. wt.=100 stone=1,000 lbs.=10,000 oz.=120,000 drams.
 (4 thous. wts.—1 ton)=40 quint.=400 stone=4,000 lbs.=40,000 oz.=&c.
 (2½ tons—1 bin)=10 thous. wt.=100 quint.=&c.
 10 standard thous. wts.—1 standard bin=100 quint.=1,000 stone=10,000 lbs.=100,000 ozs.=&c.
 4 bins—1 standard=10 tons=40 thous. wts.=100 weys=&c.

In the above table, which is a new one, but in which, for facility of introduction, old and well known Anglo-Saxon terms are employed, the most noticeable feature is its decimal system. Commencing at the unit ounce, it may be read decimally as follows:

10 ounces	make one pound.
10 pounds	" " stone.
10 stone	" " quintal.
10 quintals	" " thousand weight.
10 thous wts.	" " bin.
4 bins	" " standard.

But it is doubly decimal, since there is an alternate system running through it, as follows:

4 pounds	make one quart. weight.
10 quart. wts.	" " sack weight.
10 sack wts.	" " wey.
10 weys	" " ton.
10 tons	" " standard.

Moreover, a careful study of the table will show the facility with which any and all of its various terms may be halved, quartered, and multifariously subdivided into common fractional parts. Thus, 1 pound equals ¼ of a quart; 5 ounces equal ½ a pound; ¼ of a sack equals 1 stone, &c. The completeness with which this common fractional subdivision, so necessary in the daily use even of a decimal system, may be effected, will be best understood from the following: Since there are 4,800 grains in a standard pound, and since $4,800 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 3 \times 1$, it follows that the pound may be divided into halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, fifteenths, sixteenths, twentieths, twenty-fourths, twenty-fifths, thirtieths, thirty-seconds, fortieths, forty-eighths, fiftieths, sixtieths, sixty-fourths, seventy-fifths, eightieths, ninety-sixths, one hundredths, one hundred and twentieths, one hundred and fortieths, &c., and hence that every term in the table may likewise be so subdivided without fractional remainders, &c.; hence, if a decimal table of weights and measures be actually necessary at the present state of science and commerce, we have one in the system now discovered whose introduction will involve no change of terms in Anglo-Saxondom, whose unit (the ounce) is that of troy, apothecary and avoirdupois weights, and one, too, in which the decimal system is not only double, but which offers extraordinary facilities for the still more necessary employment of common fractions, &c.

From the foregoing tables the following facts result:

1. Since in my system the ultimate and grain are each perfect aliquots of a cubic inch

of my standard material, (5.7 water)—to wit, 1-2000 and 1-1536, respectively—and since all of my subdivisions throughout the tables, as rectified, contain whole numbers of grains, it necessarily follows that there are no subdivisions in the entire series of the tables which are not likewise exact aliquots or multiples of such a cubic inch—*i. e.*, there are none of whose cubic contents in exact mathematical terms we may not say it shall and does contain so or so many cubic inches. Take, for example, any one, as a dram apothecary; then by my system it must contain 60-1536 of such a cubic inch as I have defined, and any irregular number of drams—as, for instance, $7\frac{1}{2}$ will contain $(7\frac{1}{2}) \cdot 60-1536=23.3 \cdot 60-1536=460-1536$ parts of such a cubic inch.

II. For similar reasons every subdivision in my series of tables is exactly expressible in terms of a cubic inch of pure water at mean temperature and pressure. For as an ultimate equals .00285 (exact) cubic inch of water, and as a grain equals $\frac{125}{96}$ ultimates, it follows that any chosen subdivision, as a dram apothecary, will contain or balance $.00285 \times \frac{125}{96} \times 60$ exact parts of a cubic inch of water at mean temperature and pressure. Performing the above-indicated multiplications, the fact results that one dram apothecary (by my system) must contain $a = \frac{534375}{2400000}$ of a cubic inch of water, &c.; and $7\frac{1}{2}$ such drams, equal $\frac{23}{3}$ drams, will contain $\frac{23}{3} \cdot a = \frac{11290625}{7200000}$ of a cubic inch of water at mean temperature and pressure. Now, it is true that the above quantities are large fractions; but they are finite and exact. This is their advantage for scientific purposes, and I declare that no possible question of the above nature can be asked of my system which the tables will not answer without error in a finite form, while I know that the present Anglo-Saxon system—*i. e.*, as per statute to-day—and that the metric system of France, or any other system now known, cannot and do not dream of attempting such a gigantic problem.

III. As a remarkable sequence of the above facts, the following one results, to wit: That since water is taken as the unity material of all specific gravity, and since a cubic inch of it is expressible by my system in a determinate number of aliquot parts (*i. e.*, 5.7 cubic inches water at mean temperature and pressure equal 1,536 grains weight), and since any and all of the Anglo-Saxon subdivisions thence come out without error in parts of such a cubic inch, hence, and to that degree of accuracy with which science can, has, or shall determine the specific gravity of any substance whatever in terms of water, then to that same degree of accuracy, no more and no less, will my tables and moduli say what is and what must be the value of a cubic inch of such material in grains and ultimates. Thus, let x equal specific gravity of any substance whatever; then, a cubic inch of 5.7 material weighing 1,536 grains, it follows that $(1,536 \div 5.7) \times x$ equals the number of grains in a cubic inch of the new substance x —*i. e.*, there are $\left(\frac{15360}{57}\right)x$ grains in such a cubic inch.

Take iron, for instance, with a specific gravity of 7.125; then in a cubic inch thereof there are $\left(\frac{15360}{57}\right) 7.125$ grains. Expressed decimally the number $\left(\frac{15360}{57}\right)$ is a repetend, and

equals $269.47368421052631578947368+\&c.$; hence though finite in either form it is of course more simple in the common form. Similar remarks are in order relative to the value of cubic inches of all materials in terms of the ultimate. Thus $\left(\frac{20000}{57}\right)x$ equals number of ultimates in a cubic inch of a material whose specific gravity is x at mean temperature and pressure. The common fraction $\left(\frac{20000}{57}\right)$ is also, when expressed decimally, a

repetend, to wit: equals $350.877192982456140350+\&c.$ Such possibilities as are here enjoyed are not possessed by any other system of weights and measures upon the earth.

Having now established my unit cube [$(1'')^3$ of 5.7 density of water at Fahrenheit 68°, barometer 30",] and defined its aliquot parts in ultimates and grains, and also what my

unit ounce shall be, it is manifest that my unit cube will contain $\frac{1536}{480}$ ounces, or 3 1-5 ounces. I am now ready to explain my standard cube for heavy weights. It will be noticed that in my system of weights the one which I denominate "standard weight" ends with a term called a "standard." It is from this fact that I derive its name. Now, since this weight contains 400,000 ounces, each of which contains 480 grains, it follows that it will contain 192,000,000 grains; and since each of my unit cubes contain 1,536 grains, this standard will contain $192,000,000 \div 1,536 = 125,000$ such unit cubes, each of which is of 5.7 density of water at mean temperature and pressure; but the number 125,000 is itself a perfect cube—i. e., it equals $50 \times 50 \times 50$; hence the grand standard weight with which my system of rectified Anglo-Saxon weights culminates is a cube of 50 inches on an edge of that material whose specific gravity or density shall be 5.7 times water at mean temperature and pressure. By means of this cube I intend to extend my system upward, so as to comprehend the most extravagant demands that can be made upon it by a world at peace and engaged in universal intercourse and international commerce. A scheme for such extended use is given below, and since a standard equals ten tons, an average car-load, we have—

10 tons	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ tons} = 1 \text{ bin} \\ 4 \text{ bins} = 1 \text{ standard} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ standard or car-load.}$
10 car-loads	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ car-loads} = 1 \text{ lighter} \\ 4 \text{ lighters} = 1 \text{ barge} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ barge.}$
10 barges	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ barges} = 1 \text{ ship-load} \\ 4 \text{ ship-loads} = 1 \text{ elevator} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ elevator.}$
10 elevators	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ elevators} = 1 \text{ wharf} \\ 4 \text{ wharves} = 1 \text{ district} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ district.}$
10 districts	$\left\{ \begin{array}{l} 2\frac{1}{2} \text{ districts} = 1 \text{ section} \\ 4 \text{ sections} = 1 \text{ ark} \end{array} \right.$	$\left. \begin{array}{l} \\ \end{array} \right\} = 1 \text{ ark or harbor.}$

In the above table there runs the following subordinate decimal system :

$2\frac{1}{2}$ tons make 1 bin
 10 bins make one lighter.
 10 lighters make one ship-load.
 10 ship-loads make 1 wharf.
 10 wharves make 1 section.
 10 sections make 1 ark or harbor.

Now, it has been already shown how from the standard cube I descend (unifying as I go the grandest system of weights—the Anglo-Saxon—that the world now possesses) to the very ultimates of troy, apothecary, avoirdupois, and standard weights. Let me, however, add, before dropping this explanation, that it is evident, that though I consider the ultimate = (0.00285 exact cubic inch pure water at mean temperature and pressure) a small enough subdivision to denominate here by a special name, nevertheless, shall science find it necessary to decimate the ultimate, or grain, or the ounce, it can do so to the very limit of numerical capacity by simply removing the decimal point one place farther to the left at every division by 10. In this case, if a name be necessary, I should denominate (following our now well-known monetary phraseology of dimes, cents and mills) .000285 = 1-10 of an ultimate a "dimultimate," .0000285 = 1-100 of an ultimate a "centultimate," and .00000285 = 1-1000 of an ultimate a "milleultimate," &c. In a similar way we can have dimegrains, centigrains and millegrains, and dimeounces, centiounces and milleounces, &c.

One can hardly imagine even that the remotest science will ever be able to appreciate so small a quantity as a millionth of an ultimate. Nevertheless, as mathematics may write and employ in calculation a millionth even of a millionth (.0000000001) of an ultimate (.00285) this system admits of it in an exact number = .000000000000285, since the figure 5 in 285 is always final.

For making standard weights of comparison in each of the several branches of the system as rectified, I can of course employ any suitable material as heretofore; but I intend

to employ particularly, and for several special purposes, certain specified substances now to be noted, and which I have discovered are pre-eminently suited for the purpose, to wit: I shall probably employ an alloy so proportioned as to have a specific gravity of 5.7 water, &c. It is the density 5.7 that I care for more than for any particular kind of metal or alloy; hence I shall simply call it an alloy or substance whose specific gravity shall be 5.7 water. This substance I intend to use for the manufacture of "weights of comparison" particularly. As an example, I will note that an alloy of copper and aluminum will be the probable basis of this class of weights. It may be here noted that: $\frac{1}{2}$ [1 part copper (specific gravity $8.8\pm$) + 1 part aluminum (specific gravity $2.6\mp$)] = $\frac{1}{2}$ ($8.8(\pm) + 2.6(\mp)$) = 5.7. This alloy will afford me a very beautiful and durable standard material. Zinc, $\frac{1}{2}$, and copper, 1, would also form a good basis. The ordinary pure lead, specific gravity 11.4, equal to $(5.7) \times 2$, will also afford me a good pure metal to work upon for more compact weights. Thus lead hardened with zinc and antimony, and then again alloyed with a heavier metal to bring it back to specific gravity 2, (5.7) will give me nature's own substance for ordinary and hasty weights of commerce. Iron, however, fits my system very beautifully as a substance out of which to manufacture weights suitable to my scheme of subdivision, and for this reason: Since my standard cube of 125,000 cubic inches of 5.7 density material will exactly balance an amount of water (pure and at mean temperature and pressure) equal to 125,000 cubic inches \times 5.7 = 712,500 cubic inches water, and since I can easily obtain an iron whose specific gravity is exactly 7.125 pure water, &c., it follows that $712,500 \text{ cubic inches} \div 7.125 = 100,000 \text{ cubic inches}$ of such iron will exactly balance my standard cube. Now, my tables show that a standard cube actually weighs 25,000 rectified avoirdupois pounds; hence 100,000 cubic inches iron equal 25,000 rectified avoirdupois pounds. Therefore, 4 cubic inches iron at 7.125 specific gravity equal 1 pound avoirdupois rectified, and 1 cubic inch equals 4 ounces, and $\frac{1}{4}$ cubic inch equals 1 ounce, &c.; and since my unit ounce is common to all the branches of the system, it likewise follows that 3 cubic inches iron at 7.125 water equal 1 pound troy and apothecary rectified, 4 cubic inches equal 1 pound avoirdupois rectified, and $2\frac{1}{4}$ cubic inches equal 1 pound standard rectified.

The beauty with which my system not only rectifies the Anglo-Saxon weights, but draws upon nature herself to furnish man with standard weights of comparison, (5.7 material), hasty weights, (lead, 11.4), and commercial weights, (7.125 material), &c., is just as apparent as the idea is new. The fact is, weight, capacity and dimension are laws of nature—(man cannot originate an arbitrary one, as the French have attempted to do in their metric system, and have it survive the test of practical experience)—and I verily believe that I have discovered those fundamental principles, moduli, units, and specific gravities by means of which these things harmoniously exist.

So much for the weight measures of my system. It will be noticed that with the unit-ounce weight we can form pounds of any desired size—*e. g.*, 20-ounce pounds, $16\frac{1}{2}$ -ounce pounds, $18\frac{1}{4}$ -ounce pounds, &c., and rectify thereby and by the grain and ultimate all Anglo-Saxon weights whatsoever.

I will now turn to capacity-measures, which are intimately connected with those of weight.

Since an ounce weight of pure water at mean temperature and pressure equal 1.78125 cubic inch was the unit by means of which I have already shown Anglo-Saxon weight-measures may be unified, so I have also discovered that its cubic space (*i. e.*, that occupied by one of my rectified ounces of water equal 1.78125 cubic inches, exact) shall and must be the unit ounce of capacity. For example, a United States liquid-measure pint equals 4 gills, but a gill equals 4 ounces; therefore a pint equals 16 ounces, or at the capacity of my unit of capacity equals $1.78125 \times 4 = 28.5$ (exact) cubic inches—that is, it is $28\frac{1}{2}$ cubic inches, neither more nor less, and therefore it has the same capacity of 10,000 ultimates or of 7,680 grains, as already fixed in my foregoing discussion. The unit

being as above, I will now show the Anglo-Saxon capacity-measures, both liquid and dry, under its unifying influence.

UNITED STATES LIQUID MEASURE RECTIFIED.

4 oz.=1 gill	=7.125 (exact) cu. in.		
4 gills=1 pint	28.5	"	"
2 pints=1 quart	57.	"	"
4 quarts=1 gallon	228.	"	"
62½ gallons=1 hogshead	14,250.	"	"
2 hogsheads=1 pipe or butt	28,500.	"	" =1,000 pts.
2 pipes=1 tun	57,000.	"	" =1,000 qts.

I believe that the hogshead should be 62½ gallons instead of 63, as by my present statute. The cubic capacity of a hogshead would then equal 14,250 cubic inches, that of a pipe 28,500 cubic inches, and of a tun equal 57,000 cubic inches, and the beauty of the decimal sequence be very apparent, as well as the utility to be derived from the cubic capacities 7.125, 57 and their multiples. It will be noticed that these are the specific gravity numbers of iron and of my standard material; hence a cubic inch of iron at 7.125 placed upon a scale or balance opposite any empty capacity-measure whatsoever, and the latter filled with pure water at mean temperature and pressure until they balance, the water-line marks off 1 gill. So, 10 cubic inches of 5.7 material, balanced by water under standard circumstances, will show by the surface water-line in any capacity-measure its quart-mark, &c.

UNITED STATES DRY MEASURE RECTIFIED.

[The basis of the present measure (by United States statutes) is the "old Winchester struck bushel of 2,150.42 cubic inches." Now, I claim that this is an error, and that the true basis of the "old" struck bushel was 350 gills struck to 300—i. e., 7.125 cubic inches \times 300=2,137.5 (exact) cubic inches. At this latter quantity I shall take it, since I am working upon and after truth and unification, and so long as this table of capacity-measure shall be deemed desirable, I claim and shall maintain that it is the true basis. Taking it at this value, it will be seen to have the capacity of 100 pounds troy (rectified) of pure water. The above being premised, I will now give what is the correct table, merely calling attention to the fact that like as the rectified liquid-measure pint corresponds in capacity to a 16-ounce weight of water—i. e., to a rectified avoirdupois pound—so the capacity of a rectified pint of United States dry measure corresponds to a pound made up of 18½ ounces.]

TABLE.

	U. S. D. M	Cu. In.
1 pint =		33.3984375 (exact.)
2 pints = 1 quart	"	66.796875 "
4 quarts = 1 gallon	"	267.1875 "
2 gallons = 1 peck	"	534.375 "
6 pecks = 1 struck bushel	"	2137.5 "

THE BRITISH IMPERIAL MEASURE, (BOTH LIQUID AND DRY).

[Trautwine says the "basis is ten pounds avoirdupois of pure water at 62° Fahrenheit and 30" barometer." Hence as 1 pound avoirdupois equals 28.5=1.78125 \times 16, the true basis upon the rectified system is 285 cubic inches of pure water at 68° Fahrenheit and 30" barometer, or ten pounds equal one gallon. Hence the measures will stand as follows:]

TABLE.

	Avoir. lbs.	Cu. In.
1 gill =	.3125	8.90625 = 8 gills.
4 gills = 1 pint	1.25	35.625 = 8 gills.
2 pints = 1 quart	2.5	71.25 = 4 pints=16 gills.

	Avoir lbs.	Cu. In.	
2 quarts = 1 pottle	5.	142.5	= 4 quarts=8 pints=32 gills.
2 pottles = 1 gallon	10.	285.0	= 4 pottles=8 quarts=16 pints=64 gills
2 gallons = 1 peck	20.	Dry Measure 570. 2280. 9120. 18204.	
4 pecks = 1 bushel	80.		= 8 gallons.
4 bushels = 1 coomb	320.		= 32 gallons=16 pecks.
2 coombs = 1 quarter	640.		= 64 gallons=32 pecks=8 bushels.

To the above systems I intend to add a new table, similar in its terms and subdivisions to that denominated "standard weight," and which I shall probably call "standard capacity-measure." It is needless, therefore, to repeat it here, for I intend to employ the same unit ounce of measure or capacity, (to wit, 1.78125 cubic inch), &c., that I have already established as the constant unit of rectified Anglo-Saxon measures.

Having now described my discovery, I will briefly reiterate that the principle I have developed, and upon which I work, is as follows: I shall take a cube of 50 linear units on an edge, and fill it with a material whose mean density is 5.7 at mean temperature and pressure. Then, since it contains 125,000 cubic units (inches) of such material, it must balance 712,500 cubic inches (units) of pure water under similar circumstances, and I declare that such a weight shall consist of 192,000,000 grains, or 250,000,000 ultimates. Now, if the linear unit shall vary so as to make our present authorized inch, either + or - to any small degree, it shall not alter the arithmetical fact that I will still use 50 of such new units as the edge of my standard cube. I shall maintain that specific gravity 5.7 is the proper standard density in terms of pure water at whatever may be mean temperature and pressure of the earth, (I now believe them to be 60° Fahrenheit and 30" barometer), and I shall have the same number of grains and ultimates in the standard and unit cubes as I have above set forth. I will also say that it is manifest that to use any multiple of my discovered moduli is to encroach upon my formulæ. Having thus fixed my standard cube, and taken as my unit cube one of 1,536 such grains, or 1—125,000 of the standard, I then establish the fact that as my ultimate will occupy .00285 cubic inches of pure water at standard temperature and pressure, and as my ounce shall contain 625 ultimates, therefore my unit-ounce weight shall balance 1.78125 cubic inch of pure water at standard temperature and pressure, or .3125 cubic inch of 5.7 material under same circumstances; and by this unit-ounce weight I intend to rectify all Anglo-Saxon weights whatsoever. I also declare that the space occupied by this unit-ounce weight, when in pure water at standard conditions—to wit, 1.78125 cubic inch—shall be, and is, the unit ounce of measure or capacity.

By and with these weights and capacities, and their multiples, ranging upward and downward over the whole field of weight and capacity, and which values I believe myself to have first discovered, I intend to rectify present measures, and to use the same in manufacture of weights and measures. I claim, therefore, the undoubted and sole right. Should, however, a standard density of more or less than 5.7 (exact) be desirable, as, for instance, one of $\frac{180}{10\pi} = \frac{180}{31.4159} = 5.729 \pm$ &c.—then the relations of the system to the standard cube of 50" on an edge will result in proportional figures. Thus, $125,000 \times \frac{180}{10\pi}$ will equal $716.187 \pm$ cubic inches of pure water at standard circumstances, and all the figures throughout would correspondingly vary. For obvious reasons, however, I am of the opinion that the standard density 5.7, without further fractional termination, and because of its simple relation to the cubic volume 712,500 through the cube of 50"=125,000, is the proper one to employ. The new principles upon which I have based the present system cover, however, a density of $\frac{180}{10\pi}$ as well as of 5.7 exact, whether I desire to employ it or not, and this is because I have been the first one to found a system of metrology upon a standard density such that it shall have particular relations to, first, geometric vol-

umes—for instance, cubes (50")³, &c.; second, specific gravities, (5.7, &c.=standard, 11.4=lead; 7.125=iron, &c.)

What I therefore claim as new, and desire to secure by letters patent, is—

1. Weights, for use upon scales, balances, &c., based upon the aliquot subdivision of a cubic inch of 5.7 density material, at mean temperature and pressure, into 1,536 grains and 2,000 ultimates, as and for the purposes specified.

2. Weights for similar use based upon suitable multiples of my standard density—to wit, 5.7 specific gravity—as and for the purposes specified.

3. Weights, for similar use, made of an iron or other substance whose density shall be 7.125 water, at mean temperature and pressure, or suitable multiples thereof, as and for the purposes specified.

4. Measures of capacity, liquid and dry, based upon the fact that the standard ounce or unit of capacity-measure shall have the same volume or occupy the same space (to wit, 1.78125 cubic inch) as is occupied by a unit-ounce weight, expressed in pure water under standard circumstances, as above described.

5. The combined system of weights and capacity-measures, unified as above by my formulæ and moduli, and with or without reference to any particular standard temperature and pressure, as and for the purposes specified.

6. Cubes (standard, unit, &c.) of material 5.7 times the density of water, at mean or standard circumstances, marked, stamped, or otherwise designated to show their value in aliquot parts, and their several relations to the foregoing system, as and for the purposes specified.

7. Cubes and other geometrical solids suitable for reference, and of specific materials, metals, alloys, &c., duly stamped, engraved, or otherwise marked, so as to show their relations to the foregoing rectified system of measures, for use as standards of reference, &c., as and for the purposes specified.

Witnesses:

H. A. SPRINGETT,
A. B. DYER.

C. A. L. TOTTEN.

NEW MEASURES OF THE GREAT PYRAMID BY A NEW MEASURER.

DESCRIBED BY C. PIAZZI SMYTH, ASTRONOMER-ROYAL FOR SCOTLAND.

PART II.—THE INTERIOR.

On changing from our late topic of the exterior to the new one of the interior of the Great Pyramid, much praise is due to Mr. Flinders Petrie for his grand handling of the measures made, and his apparently accurate connection of the ancient outside restored with the existing inside of the building produced so as to meet it; bearing in mind, however, that he is tacitly assuming the upper surface of the pavement, and not the socket corners of the base, as the level to be always referred to. The matter, however, immediately to be discussed, will not be sensibly influenced thereby.

First, for instance, comes that most strange fact, so subversive of Professor Lepsius' and other Egyptologists' favorite "law of pyramid building," viz., that in place of the *subterranean* chamber being, as everywhere else with the subsequent and perfectly Egyptian structures of that kind, the first thing completed at the building of a pyramid, and

the object for which the whole edifice was to be afterwards erected by slow additions above ground, year after year—said subterranean chamber was never even approximately finished at the Great Pyramid. The vast size, moreover, of that unique monument is shown by Mr. Flinders Petrie to have been planned and laid out for that full size from the first, and by no means to have been a result of slow "accretion" dependent on the accidental duration of life of a single individual, according to the so-called "law" of a few modern doctrinaires.

But the sloping passage, leading down to that only commenced subterranean room, was beautifully built at its upper end; furnished, too, at the very top with a closely-fitting stone door hung on horizontal stone pivots, and cut off from all the rest of the interior by solid-looking masonry, which told no secrets to any man or nation until three thousand years had passed away. For then, in the hearing of Caliph Al Mamoun's workmen, who were rudely breaking a way for themselves through the limestone core, a prism-shaped stone fell out of the roof of the descending entrance passage (which was much closer to them at that moment than they had been aware of) and disclosed that another passage *ascended* into the interior from that point, but had its lower end plugged with, to them, immovable blocks of granite.

All this, however, is the old, old story of John Taylor's Great Pyramid theory, except the neat supplying of the door in the casing by Mr. Flinders Petrie; and which is not only likely enough, but is probably—from its having fitted close and got jammed after the days of the Romans—the very reason why the Mohammedans, under the eastern Caliph, did not attempt to enter the Pyramid in the right way by the "door," but broke in through the solid masonry below, and on one side, like the thieves and robbers they were. Breaking their violent way also round the granite blocks still plugging the lower end of the ascending passage; and then, whether there were many or few, more plug-stones above those we still see in place, got rid of them somehow or other, as by breaking and extraction, until they found the way clear before them up through the rest of that passage; thence, on the level of its upper opening, to the queen's chamber, by the still further ascending grand gallery to the ante-chamber; and then to the final king's chamber of red granite, with the coffer of the same material as its only contents.

The general structure, closeness and regularity of the joints in both the king's and the white-stoned queen's chambers, frequently come in for Mr. Flinders Petrie's high praise; though the building of the passages between (Mr. Waynman Dixon's girdle-stones of the first ascending passage excepted) is blamed for much rough and bad work. Some of it, indeed, as at the north end of the ante-chamber, being even declared so bad, as if it had been to show how badly instead of how well, as elsewhere, pyramid builders could build; while the well, leading down to the north-west corner of the grand gallery, through the grotto, to the lower subterranean part of the long sloping entrance passage, is stigmatized as very poor work indeed.

But the whole of these ascending passages and chambers are allowed by Mr. Flinders Petrie to form a system the like of which is known to exist nowhere else—*i. e.*, nowhere else adopted into a pyramid; for the peculiar trial passages on the Pyramid's own hill are recognized by him to be a reality. Though none of the Egyptologists can declare why, or wherefore, a vertical shaft is found there at the junction of the ascending and descending systems; or why, if there, a similar feature has not been found at the Great Pyramid.

So giving up the more difficult task of explaining that primeval monumentalization of so much that is rich and rare in thought, our new author proceeds to the far easier task of pulling to pieces my mensurations of 1865.

My angular measures, indeed, are usually left very nearly intact, but the linear measures are declared to have a small slowly-increasing error, due to measuring with loose rods on the sloping floor surface of dark passages; while at one particular place in them it is asserted my rods must have slipped, and a length of 2,173 inches been mistakenly reported

as 2,170. That is, fortunately, of no necessary importance, for I had already set forth in print that the 2170 looked like an accidental coincidence with a certain other 2170 number and was closer than warranted by the circumstances under which the measuring was performed. While, if it is also asserted now by Mr. Flinders Petrie that the grand gallery is really 1883·6, and not as I had made it, 1882·8 British inches long—whoever likes may look on that as enormously erroneous, but must confess it less discrepant than the three mensurations previous to mine, which were 1896, 1872 and 1824 of the same units.

But let us hasten on to the chief work of the interior, the granite king's chamber. What is the length of that? "Very various," Mr. Flinders Petrie would probably answer; and from a remarkable plate (xiii. and pages 79 and 80), wherein he shows the chamber's errors (largely produced, however, by mediæval earthquake shocks), concentrated on a plan of his own, multiplied fifty times, and looking, therefore, horrible—he would make its length at the top close under the ceiling 412·01; and at the floor, 412·66; I having made it at a few inches above the floor, 412·54, British inches.

Wherefore, if the room was only intended for funereal purposes, that was coming closer than there was any practical occasion for. But if it was also intended by the architect thereby to indicate the size of the exterior socket-base of the building by the theorem of the John Taylor system of explanation the measures are still close enough; but the required quantity is within the limits given by Mr. Flinders Petrie.

The grand attack, however, on behalf of Egyptology, is delivered upon the "coffer." That was, according to John Taylor, the vessel of whose cubic contents the old Anglo-Saxon *quarter* was the *fourth* part; and though it has some slight cuttings into its geometrical shape for apparently sarcophagus purposes, and may even have been used as such, it is yet a very remarkable mensuration-looking vessel, not only from its figure, but the absence of inscription, figuring or ornament, and for the striking manner in which it was at its remote age—long before written history—positively sawed out of extra-hard and dense syenitic granite, by huge bronze saws more than eight feet long, armed along their cutting edges with teeth of sapphires, according to the exceedingly ingenious speculations of Mr. Flinders Petrie, and the interior drilled out by similarly jewelled tubular drills three feet long.

He set to work, therefore, on his mensuration *critique* with zeal extraordinary, making off-set measures from no less than "388 points on the outside to 281 on the inside, or 669 in all; besides taking 281 caliper measures" (p. 84). Magnificently accurate results would this have given, had it been performed 4,000 years ago, on the then whole and entire vessel; but it has not the power, and Mr. Flinders Petrie's description by no means enables his readers to realize the fearful amount of the substance which has been broken off and carried away at some time or times before he came to measure it. He may be the best measurer that has ever appeared at the Great Pyramid, and his measures may, or as he not obscurely informs the world, must be, the only ones to be employed in future Pyramid investigations, not only of a single block, such as the coffer, but of congeries of blocks, which are now cracked and separated by pressure and seismic violence out of the relations in which they once stood to each other. And yet some persons will maintain, on the opposite side, that where much material of an ancient and otherwise unknown form has been long since removed—or a solid block been crushed—lost is lost, and gone is gone so completely that no one now living can pretend to be perfectly capable of exactly restoring it all.

Such, however, as Mr. Flinders Petrie measured and added to by calculation he gives thus for the "coffer" (p. 90): Contents, 71,960; solid bulk, 70,630; volume over all, 142,590 British inches; while four times the earliest known Anglo-Saxon quarter measure of wheat is usually assumed, though with large margin of uncertainty, as 70,982 British cubic inches, or between his two first statements.

With similar approximating results we might go over his measures of the ante-chamber

where the theoretical quantities, as hitherto stated for the John Taylor theory, seem always to be found among the lesser and greater measures Mr. Flinders Petrie gets of the ruined or dislocated forms; though, instead of accepting them as in any way confirmatory thereof—or, as I have so particularly set forth in 'Our Inheritance' fourth edition, as a rude index to more exact things in the king's chamber—he prefers to inveigh against both the errors of the ancient work and the gullibility of modern theorists.

This is the case especially with the "boss" of the granite leaf. He allows there (p. 71) that the measures of its thickness are, some under, some over one inch; and of its breadth, some under, some over the five inches claimed for it. But then he considers that he has already smashed the whole theory by declaring that such a projection was a common feature left on granite blocks to assist in moving them; and he has found, by looking narrowly with a side light, traces of there having been once some much larger bosses on the granite stones in the king's chamber. To all which we can reply—that those bosses were by Mr. Flinders Petrie's own measures neither of the right size nor in the right places to serve the metrological purpose of the one boss on the granite leaf. While as to a boss having been a common feature for the lifting of blocks in old Egyptian buildings, that is exactly what has saved that one particular boss from special destruction during the ages that are passed—just as the numerous burial pyramids round about the Great Pyramid have saved that one through all history from peculiar Egyptologic devastation, and enabled it faithfully to carry on to these last days a prophecy breathed into it of old by inspiration from the God of Israel.

But in the queen's chamber examinations something rather *morally* instructive comes out. Mr. Flinders Petrie describes the niche there as being, in its several parts, 3 or 2 or 1 or $\frac{3}{4}$ cubits in measure; such cubit being always with him the cubit of idolatrous, Cainite, ancient Egypt, 20.6 inches long, with limits "of—0.66 and + 0.36 inch," while he intensifies that finding by adding thereto (p. 68) "and there is no evidence of a cubit of 25 inches here!"

This is doubtless in allusion to my having claimed the remarkable eccentricity of the niche in the east wall of its chamber—amounting by the measures of several critical explorers after me to 25.025 British inches (see p. 425 of 'Our Inheritance in the Great Pyramid,' edition 4), as the most admirable and scientific method that could well be imagined for representing one single concrete example of a short linear standard, in an unexpugnable manner in a vast building. It was also a splendid illustration of the general metaphysical ruiing of the John Taylor theory of the Great Pyramid—viz., that though it was erected by Egyptian laborers, and even built to Egyptian measuring rods in each small step by step, it was yet caused in its whole result to bring out a purpose of an overruling divine influence which, as I have dilated on years ago in 'Our Inheritance,' the Egyptians did not understand, and never came to understand through all their history, and would not have liked if they had understood it.

So here, before our eyes, is an enthusiastic young modern Egyptologist, delighted to bring out the Cainite cubit of old Egypt into honorable notice for small things, and actually declaring (p. 68) after doing so, "there is no evidence of a 25-inch cubit here"—although, too, he had himself just measured the eccentricity of the niche, and found it, at its lower, larger and most important section, 25.1 British inches! What is not this, therefore, but the modern Egyptologist falling into exactly the same pit of blindness and unbelief that was prepared for the native idolater of that country of old. He, that pure and perfect one in his own eyes, used the profane cubit in his own forced work at the Great Pyramid, and never saw that it was being overruled then and there alone throughout Egypt, to bring out, in terms of the sacred cubit of Israel and the Bible, higher things than he and his co-false religionists had ever dreamt of.

Hence I have nothing to alter in regard to what I have written during years past, either on the queen's chamber niche and its eccentricity sacred cubit by measure, or of the

ancient Egyptians from the Biblical point of view, or yet of the tendency of modern Egyptological studies. In fact, this very clever book of Mr. Flinders Petrie supplies so many further examples of the same kind, that I do hope the *Banner* editor will grant me space for at least a few lines touching two more of them.

The first case comes on thus: The young Egyptologist concludes one of his chapters grandly with commendations on the accuracy of the Greek historians, especially as compared with modern travellers; but it is only on such points as will not interfere with his own views in general. So, although he glorifies their reported lengths of the base side of the Great Pyramid in terms of nearly unknown units and standards of measure, he says nothing, so far as I can find, of that most telling account in Herodotus' best manner, touching the shepherd Prince Philition having been, in the eyes of the Egyptian people, the effective ruler and director of the two greatest Gizeh Pyramids. Now, from the first publication of John Taylor's 'Who Built the Great Pyramid,' to the fifth edition of Charles Casey's 'Philitis; or, the Mystery of the Great Pyramid Solved,' that Greek admission of an extra-Egyptian and eastern influence prevailing peaceably over the King of Egypt at that time, is to all earnest Christian believers in the Bible the most precious key to the mode of introduction of Hebraic divine inspiration into the plans, proportions and ultimate objects for building the Great Pyramid; Philitis or Philition having been certainly a shepherd prince of Palestine, and probably either Shem or Melchizedek.

Nor did the divine inspiration at the Great Pyramid, so far as all history and antiquity may prevail to indicate, extend to a single other individual beyond Philitis. At the construction of the tabernacle in the wilderness, many hundred years afterwards, it was far otherwise. For there, the Scriptures declare that not only did Moses receive instructions from God, but the workmen under him, as Bezaleel, the son of Uri, was filled (by God) with the spirit of God in wisdom and understanding and in knowledge, and in all manner of workmanship (Exod. xxxv.). And still more widely in Exod. xxxvi. "Bezaleel and Aholiab, and every wise-hearted man, in whose heart the Lord had put wisdom, even everyone whose heart stirred him up to come unto the work to do it." But there were no such workmen known at the Great Pyramid. They were born Egyptian idolaters all, and remained so throughout, notwithstanding that other sentence in those accurate Greek writers, but which Mr. Flinders Petrie nevertheless declines to give any place to—viz., that the idolatrous temples of Egypt were forcibly closed during the whole time of the building of the Great Pyramid of Gizeh, and only reopened, and then to worse idolatry than ever, in the times of King Mencheres, of the third pyramid.

Unwilling then, and idolatrous still in their hearts, as the Egyptian workmen at the Great Pyramid were, how can we expect otherwise than that they scamped their task-work on every possible occasion; or just as the sharp-eyed, keen-witted Mr. Flinders Petrie finds so many examples of? We must, therefore, really and heartily thank him for dragging these peccadilloes to light, and for reminding all Christian pyramid students thereby that the mere workmen's handiwork at the Great Pyramid, having nothing of divine inspiration directly about it, was not, and could not have been, perfect. The cutting and placing, therefore, of stones, and the stones themselves of the Great Pyramid, are not to be regarded with worship by anyone, and are only to be held in any account at all by any believer in the Bible, in so far as they may enable us to approximate to where the divinely inspired ideas were centered—viz., in the spirit of the superintending Melchizedek, or Philitis.

We may truly rejoice, therefore, that Mr. Flinders Petrie has so many cases of error to charge against the idolatrous Egyptian workmen, as when he finds that in sawing the end of the coffer they twice over got their saw too far within the appointed line, and had to "back it out" and try again. Said saw, too, of brass and iron, set with jewelled teeth, being further so amazingly like what we might expect to find among the Cainite Egypt-

tians, after what the Bible has said of the inventions and constructions of Jubal and Tubal Cain.

But when we arrive at last at the all-important chronological date at which these memorable Pyramid events took place—alas! how Egyptianized has not Mr. Flinders Petrie himself become in six short years; for in 1877, in his then deeply-studied Pyramid diagram, he attacked the John Taylor passage theory, because it did not give the dates of either the Septuagint or the Hebrew version of the Bible, and condemned my 2170 B. C. date of the Great Pyramid as being too early, because there were not (in accordance with those Biblical chronologies) enough men on the earth so soon after the deluge or babel to erect such a building. But now he drops the 2170 B. C. date (pp. 188 and 191) because it is not agreeable to modern Egyptology; and while suggesting 3400 B. C. for discussion as more likely, says not a word about its flat contradiction to both of his formerly quoted sufficient authorities—viz., the two chief versions of the Scripture history of the world and man.—*The Banner of Israel*.

THE LOGIC OF THE PYRAMID.

BY CAPTAIN R. K. CARTER.

PART II.

In the first article, under the above title, we showed that the great argument from design finds the same ground for support in the Great Pyramid of Jeezeh as it does in the curious coral formation called Neptune's Cup, and the strange carnivorous or insect-eating plants; and we further submitted the claim that the building of such an edifice, containing so many wonderful correlations of measurement, was and is an absolutely impossible problem for the unaided mind of man. Upon this last claim the whole case of the inspiration of the Pyramid could be safely rested, but we propose to carry the matter very much further, by passing from the argument of design into that which we will call *scientific demonstration*. We use the term advisedly. It has been said that the inspiration of the Pyramid and of the Bible cannot be *mathematically* demonstrated. Sceptics call for reasoning similar to that used in geometry, and refuse to listen to any other. Jesus Christ said: "If they believe not Moses and the prophets, neither would they be persuaded though one rose from the dead"—and humanity has not altered one whit since the days when the Saviour was upon earth. We feel convinced that no proof will ever convince a man who is pre-determined to doubt and disbelieve anything that savors of spiritual things. Nevertheless, we thank God that we have been permitted to first place before the world, in answer to the sceptic's call, the very mathematical proof desired. We refer to the feature which we have styled the Impossible Problem. In geometry numerous propositions are proved by the method known as the *reductio ad absurdum*—everything to the contrary is shown to be untenable, and therefore the truth of the proposition is sustained. When we showed that the planning and construction of the Great Pyramid was a feat impossible for any man or collection of men, in any age of the world, we hold that, by the same geometrical method of the *r. a. a.*, we have proved the truth of the proposition that the builder was either superhuman or superhumanly inspired. But of this, more anon.

Let us now take up the scientific demonstration of the inspiration of the Pyramid. We use the term scientific, because the method to be followed is the same that is pursued by all investigators in any branch of science. As the former argument will best apply to those who do not accept God's revealed word, so this will adapt itself more readily to

those who believe the Bible to have come from God ; but at the same time it furnishes an excellent link in the chain of evidences of the truth of that word. All will admit that the Bible in full has existed for hundreds of years before the measurement of the Pyramid was ever thought of. Then let us note the following relations existing between the measurements of several Bible structures and those of the chamber and coffer in the Pyramid. First, the ark of Noah had a capacity exactly equal to that of the coffer multiplied by 100,000. The ark of the covenant had a capacity of 71,250 cubic inches, exactly equal to the capacity of the coffer, and hence equal to the same fractional part of Noah's ark as the coffer. The court of the tabernacle, *leading to the ark*, measured 50 cubits everywhere ; and, leading to the coffer, are the 50 courses of masonry on which it rests. These 50 cubits equal 1,250 inches, and this multiplied by 5.7 (the mean density of the earth) gives again the capacity of the ark and coffer. Next, Solomon's molten sea had a capacity (of mean earth matter) of 625,000 cubic inches ; multiply this by 5 and we have 3,125,000, the number of square inches in the court of the tabernacle. (5 is not taken at random, but is a special number present everywhere in the chamber). Again, the water capacity of the molten sea was 3,562,500 cubic inches, or exactly 50 times the capacity of either ark or coffer. The king's chamber in the Pyramid has in its walls five courses of masonry, laid horizontally ; and the coffer is just as high as the lower layer. The entire volume of the room, from the floor to the height of this first layer, equals 50 times the volume of the coffer, or equals exactly the molten sea.

Now we come to the Holy of Holies, the chamber where God visibly abode. It measured 20 cubits every way. The great brazen altar was 20 square and 10 high, giving a volume of one-half the Holy of Holies. But the area of the tabernacle court, 3,125,000 multiplied by 20 equals 62,500,000, which is the cube of the altar and also 100 times the molten sea, or 5,000 times the capacity of ark and coffer. Finally, the capacity of these last was 12,500, and the capacity of the Holy of Holies was 125,000,000 cubic inches, or just 10,000 times the former. There are a great many ways in which the measurements of the Holy of Holies stand related to the earth, as for example : in its polar diameter, mean density, cubical contents and actual weight ; but the above comprises all that is necessary to show the undeniable plan running through each and all of the structures mentioned. We come now to the argument deduced from the observation of the facts. If a scientist should have five fingers of a hand buried in the earth, and upon examination discover that the different joints exactly fitted together, he would at once exclaim : "These are all members of the same hand"—and no one would think of denying the assumption. If he found four fingers together, and after noticing the nice precision with which they were placed side by side, and with which they worked against one another, should find a fifth finger at a distance which, when placed by the others, exhibited the same general proportion and fitted at the joint with absolute smoothness, again he would claim that the same arm had controlled them all, and the man who attempted to deny it would be looked upon as a fool or an ass. This would be a clear case of scientific demonstration. Now this very thing has been done and is shown above in the case of the Pyramid. We have for the first finger the ark of Noah ; next the ark of the covenant ; then the Holy of Holies, and the molten sea, making four fingers which we who believe the Bible know to have been specially shaped by the inspiration of Omniscience, and which even infidels must admit, have stood upon the pages of the Bible for thousands of years as the ostensible word of God. These four fingers have been shown above to work harmoniously, and to display a wonderful interrelation in all their numbers ; and now we have found a fifth finger—the chamber and coffer of the Pyramid—which displays the same curious plan, and, when applied to the rest, fits into its place with an absolute perfection never attained in ordinary science, and at once calls forth the logical and scientific declaration, *this belongs to the same hand and was evidently controlled by the same arm*. Is anything the matter with that logic ? Let us see who will undertake to refute it. Had Professor Huxley succeeded in discovering

links in the chain of his few lame prehistoric horses, joining them to the modern animal with one-tenth the accuracy of the above evidence, he and the whole scientific world would have clapped their hands in delight at the wonderful proof of the theory of evolution. But such proof being, as they themselves candidly acknowledge, totally wanting, they simply prove the truth of the old proverb, and straining violently at the gnat of divine causation, swallow at one gulp the huge camel of their own sadly misplaced faith.

In closing let us summarize the above. First we have the argument of design, so startlingly set forth as to admit of no denial, and as John Stuart Mill reluctantly confessed where there is design there must have been a designer. Next we have a proposition to be proved geometrically. It is this :

"THE BUILDER OF THE PYRAMID WAS INSPIRED."

Let us suppose that he was not inspired. He then was an ordinary man. But the coffer alone presents so intricate a plan that no man could possibly have designed it, not to mention the chamber and the Pyramid itself. Therefore the supposition that the builder was not inspired results in an absurdity, and hence the proposition is proved, Q. E. D.

Thirdly, we have the philosophical or scientific argument, deduced from observed facts, that the Pyramid exactly corresponds and is interrelated with four structures known to have emanated from the hand of God ; and, as this correlation passes all bounds of possible coincidence, it must have come from the same hand. We then close with these questions :

- Who made the carnivorous plants ?
- Who made Neptune's cup ?
- Who made Noah's ark ?
- Who made the ark of the covenant ?
- Who made the Holy of Holies ?
- Who made the molten sea ?
- Who built the Pyramid ?

Its very planning remains to this day, for any man, an IMPOSSIBLE PROBLEM.—*Heir of the World.*

* BIOGRAPHY OF REV. SIR HENRY B. WREY.

"The Rev. Sir Henry Bouchier Wrey, 9th Baronet, was born in 1797, succeeded his half-brother, Sir Bouchier Palk Wrey, in 1809 ; was educated at Balliol College, Oxford, where he took his M. A. degree in 1821. He was appointed Rector of Tawstock, and a J. P. for Devonshire. The family motto is, "*Le bon temps viendra*"—"The good time will come." The family of Wreys is of considerable antiquity in Devonshire and is supposed by Wotton to be descended from Robert le Wrey, who lived temp. Stephen. Sir Chichester, the 2nd Baronet, a faithful adherent to the royal cause, became in 1652 possessed, by marriage, of Tawstock—another family seat, being Holne Chase, Ashburton. After the Restoration he was successively Colonel of the Duke of York's regiment, Governor of Sheerness, and M. P. for Lostwithiel. Sir Bouchier, the 3d Baronet, served under the Duke of Monmouth, and after the Restoration commanded a regiment of horse. The 5th and 6th Baronets were each Members of Parliament. The Wreys came into North Devon in the reign of Elizabeth as the Earls of Bath, armed with large powers to sweep

* Extract from an obituary notice in an English paper, 1882.

away popery out of that part of the country. The deceased was at the time of his death president of the Barnstaple Conservative Association. On his re-election to that office—although then believing himself to be on his death-bed—he penned a beautiful letter to the columns of this paper, which was published on Sept. 30th, manifesting his deep interest in the cause, and his apprehensions as to the effects of modern radicalism. Since that time the deceased lingered on, sinking and rallying alternately, until a few weeks ago, when a decided change took place, and retaining consciousness up to very recently, he succumbed to the ravages of old age, and passed quietly away at the age of 85."

This fine old man was always a staunch member of the Church of England, as by law, and history, and the wishes of the people long since established. He inclined, therefore, rather to what is now too often called the Low Church party, and had the good of the mass of the population around him always most sincerely at heart, taking almost as much interest in their schools as in the Church. It was in his visits to the schools of the parish that he was first confronted with the over-zealous proceedings of the French metric advocates, who for a time got the upper hand with some members of the British Government in London, prevailing on them to send large printed placards of those most revolutionary, most un-Anglo-Saxon weights and measures, framed and varnished, to be hung up before, and learned by heart of English children, in every national schoolroom throughout the country.

Now Sir Henry had already not only become acquainted with the Great Pyramid system of weights and measures, but believed that it was given originally by divine inspiration; also that the British system was descended from it, and to be perfect should be brought back to it again, and might most easily be by some very minute alterations. He writhed, therefore, in spiritual agony, at seeing his beloved school-children compelled by a pseudo-government order to forget or despise their own national and hereditary system, and learn day by day a totally different modern invention, prepared by foreigners in the midst of a national phrensy of atheism and revolution among themselves.

But "the good time" of his motto came at last. The eyes of Government were opened. They saw that it was not the British *people* that wanted the French measures to be made compulsory over them, but a little knot of secret agitators. So a second order was sent out to take down the school placards again, which, moreover, had never been legalized. No sooner was this known than Sir H. Bouchier Wrey instantly went over to his parish school, and not only assisted in tearing down the detested document, but in breaking up the varnishy thing, and putting it into the fire; "and," as he wrote to a friend in Scotland, "it burnt well!"

Since then he has ever been an interested watcher of Pyramid progress; the rise of the Pyramid subject in America; the failure of rationalistic science, though supported at enormous expense, to beat the Pyramid sun-distance of old, and the beginning of the accomplishment of the Biblical prophecies of these latter days. His great age at this time prevented his doing more; but he lived up to his last day in the firm belief that though "the enemy would come in like a flood, the Lord would lift up a standard against him."

Sir Henry published an essay on the Great Pyramid subject in 1874, entitled "Notes on the Great Pyramid," which went through two or three editions.

C. P. S.

LETTERS.

LETTER FROM LT. C. A. L. TOTTEN.

GARDEN CITY, L. I., Feb. 7th, 1884.

My Dear Sir:—I have for a long time been intending to write you and congratulate the Institute upon its Magazine. To me each number seems an improvement upon those which have preceded, and the January number is unquestionably a most able and interesting one. I am particularly struck with Jacob M. Clark's discussion of Ballard's theory, and am convinced that he has conclusively shown that Mycerinus and Cephren were pyramids built by Pharaohs, who, so to speak, "knew not Joseph." Mr. Wood's contribution versus Petrie's book is also an opportune paper. I am now studying Petrie carefully, and find in it much that is of immense value to the theory of John Taylor. Upon its surface, and as read in his own work, Petrie's book seems to be inimical to the metrological ideas of our school; but when the measurements are viewed by themselves and upon their own merits, I find them not only of immense value but undoubtedly reliable, and I am forced to draw from them just the opposite conclusions from the author. While in Philadelphia last month I ran across a copy of John Taylor's original book, 'The Great Pyramid, Who Built it, and Why Was it Built?' I had not had it in my hands for ten years, so I bought it, feeling that I would freshen my mind upon the idea as originally propounded by that father of modern inquiry at Gizeh. Upon reading this interesting book I am filled with amazement, for I find that many articles from our ablest writers are simply wanderings over the paths originally staked out by John Taylor, and that we are expending too much time in re-proving what he so ably did years ago. I do not think that a better work could be done than to re-edit John Taylor's work, particularly his first part, which deals with the metrology of the ancient surveys, and mould it into a more modern shape. I verily believe that with the light which we now possess upon the monument—*so much more* than Taylor had—and with dates now true to several places of figures farther than his, some one could make a *conclusive* book. The man to do it is Jacob M. Clark. He and Taylor, so far as I have been able to gather from the published works upon the subject, whether within our own school or not, seem to have been, and to be, the best posted, and of a bent of mind best equipped to handle the subject of the ancient surveys of the world. Do try and induce Clark to undertake this work. I have loaned him my copy of Taylor, hoping that he will be tempted to the task. I would like to see this book, argument by argument and line by line rewritten, and only altered so as to furnish figures which were beyond the reach of Taylor, and yet which are now fully established and within our grasp. In the meantime I cannot suggest a more valuable companion for the pyramid student of our day—for every member of our Institute—than the same volume. It will save so much labor if they become familiar with this ancient pioneer.

By the way, I enclose a copy of that part of my system of metrology which is at present in condition to be made public. You will notice that I have patented it. I do this for several reasons. In the first place it is worth patenting, and as a new means of unifying our present system, I do not know how I could render the Institute a greater benefit than by securing such letters. You know it has been cast up against us, time and time again, by our enemies that our work could result in nothing *practical*. Here, then, is a direct refutation of the slander. The system which I have been fortunate enough to evolve from

Pyramid study is eminently practical, and whether or not it is that of the monument itself I verily believe that it is earth commensuric, harmonious, and of vastly practical Anglo-Saxon possibilities. I have yet another part—linear measure—to disclose in due time, and I doubt not my fellow-workers in the Institute will find in it as practical and as valuable ideas.

I firmly believe the Pyramid is built to teach us the true metrology, and I also know that this science is the very science of all others. It is a practical science, and I am going to study it from the practical standpoint. If we can show our opponents that there is a rich mine of ore of truly practical value in the Pyramid, they will soon cease asking the old and idle question of Nathaniel, "Can there any good thing come out of Nazareth?" and more than willingly obey the mandate, "Come and see!" Now the value of such a patent is, of course, a thing of the dim future; but as a scientific scheme, I firmly believe it is of inestimable worth. In the meantime, it has to the Institute a *practical* value. I want the Institute to authorize an expenditure of money under what we can now control, and help me manufacture a quantity of little "unit-cubes" of mean density material stamped and marked with their Anglo-Saxon references, for use in advertising our Egyptian Expedition. My idea is that we have such cubes made, and stamped with the arms, etc., reverse of the seal, and their reference to the 1" the 1²/₂, the 1³/₂ the ounce, pound, pint, etc., and put them out in order to get funds for the expedition. The little cube will be a thing of beauty and *practical* utility. It can be used as a *paper weight* and will at the same time be a most valuable advertisement of our Institute, and of what we are working to accomplish. If we can manufacture them for a nominal sum each, say 25 cents, they will easily sell for double that, and the funds to be derived be of no small account in assisting to equip the expedition. My idea, further, is that the upper face of the cube bear the inscription of our Institute. That another face have the arms and crest, the opposite one to that the reverse of the seal and the remaining 5 be devoted to metrologic references, etc. Tell me what you all think of the plan. I doubt not that we can find manufacturers who will undertake to make these cubes for us very reasonably and without any original outlay.

Now, I know that you will see the remarkable sequence and beauty of the system that I have evolved, and at the same time I know that you will be disappointed in it in so far as I fail to find any reference necessary to the analytical unit of the 360° circle. I do not believe in that division of the circle. I agree with Jacob M. Clark that it is entirely Babylonian, and savors of Nimrod and imperfection. The argument presents itself to my mind in this way—(and I find the stumbling-block insurmountable): A circle *cannot* be *geometrically* subdivided into 360 equal parts. No mathematician can get a sexagesimal degree. Is it to be presumed, then, that THIS monument, so perfect in all its metrological references, was built with any significance whatever to a circle of 360°? But if the circle of 360° falls, then likewise fall all the English inch references throughout the Pyramid. And that is just what I predict. The beauties you and Mr. Dow and others have discovered are *ratios*. This has been repeatedly pointed out both by Mr. Clark and myself, and yet to this day I fear that we two stand almost alone among American Pyramid students in advocating a 240° circle, and a 25 inch standard. However, I know your earnestness too well to fear the issue when once your own mind shall have been satisfied of these facts. The *value* of your work will remain, though the *reason* of it may become a different one. Each one of these beautiful ratios which you have pointed out will be an important factor in our grand argument in favor of this mighty monument, and I cannot but regret that up to the present time, while really laboring *together* towards the same end, we should have been led to interpret these readings in so entirely different a manner.

Now I never have been able to explain to my own mind how it was that several of our best workmen—yourself, Mr. Skinner, Mr. Dow and Mr. Searles, have so entirely ignored the 365.24224 reference in the primary base line, and the *numerous* other references to it

with which this building teems. Why the very number $116.26 +$ etc., which we find repeated there so often, is but the *ratio* of Y to π , in which $Y=365.24224$, and $\pi=3.14159265$, etc. True it is laid out in inches in the ante-chamber, but I am convinced they are and must be *Pyramid* or earth-commensuric inches. In this interpretation do you not see that you are directly against Taylor, Smyth, Baxendell and many others who have arguments in *their* favor quite as strong as those advanced for the present inch theory? But Taylor, chief of all—let me give the originator his full meed of praise—and to his book I earnestly request you once more to turn your attention. Give it a fair reading, and with that and Smyth's 'Our Inheritance' in hand, and Baxendell's formulæ in mind, see what a *light* your own labors throw upon the Pyramid regarded as a grand ratio, and a grander *harmony of ratios*. It is in these *ratios* and their *PROPER* interpretation that the true secret lies.

I have a very long and exhaustive argument in favor of the earth-commensuric theory that I have nearly ready for publication. It is the article I was writing when I addressed the long letter to the Institute containing the nine questions. But it is much too long to send to be read aloud or to be printed in the Magazine even in numbers. I am trying to induce an eastern publisher to get it out. It goes into this matter very deeply and draws upon the Pyramid and the ancient Hebrew system of metrology in a way that *I know will surprise you*. It will contain a great many diagrams too, which so far as the 25 inch cubit is concerned, I am sure will leave no room for doubt either of its value or its positive Pyramid reference—no more than we *now* have of its lofty earth reference. I do wish you knew of some one who would endow the Institute with a fund that would publish such papers, but how can we expect them to when even our able Magazine has to struggle so hard for an existence.

I congratulate you all upon the possibility of a speedy fruition to the American Pyramid Expedition, and would give most everything to be able to join it, as I have some notions of my own relative to its indications that I want to follow up. What are the present chances of the expedition for this year? Clark telegraphed you, I believe, about my last visit to Washington relative to the 'Great Seal.' Well, I accomplished little or nothing in that direction. I fear that the State Department will go wrong, as certain indications portend; but if it does, then it is because it is not yet time to appreciate the full light let in upon us by the true interpretation of this wonderful bit of symbolism. One might almost be led to the same conclusion from the disheartening response I have met with in my efforts to publish my 'History, Heraldry and Significance of the Great Seal of the United States.' I have struggled to get help for a year, struggled might and main, but actually have only about 130 names of people willing to help me! Could I only double that number, I would be all right, for I have found a publisher who will put the work out in good shape if I will guarantee him 300 names. I fully expected that in our Institute that number would assist, but I have of our members only about a dozen!

Write me at an early date what you think of the system of metrology, and let me know when you visit New York again.

Yours ever sincerely,

C. A. L. TOTTEN,
U. S. Army.

LETTER FROM J. K. HORNISH.

DENVER, COL., February 26, 1884.

Dear Sir:—Your favor of February 20th received. I appreciate your kind feelings for Gov. Lowe. My acquaintance with him began in 1850, and continued, until his death, friendly and intimate. I well knew his worth and zeal in all good causes.

I fear you have not understood my inquiry in relation to the North Star. I think I read in one of Professor Proctor's reviews of Professor Smyth that the *present North Star* was visibly manifest from the descending passage. Is this the fact? I understand that a retrospective calculation for 2170 B. C. makes "*a Draconis*" the polar star at that date; but, my point is, does this passage *now look out on our present North Star*? My other point is, what relation does the sun sustain to the Pyramid at "high 12" vernal equinox? Does it cast a shadow on north side, or does it illuminate the north side—no shadow? These two points, or facts, are material to my estimate of the design and meaning of the *Kiops* Pyramid. My investigations were begun and prosecuted outside of all pyramidology as connected with Egypt. They are now only focalized on the Great Pyramid, because the philosophy of numbers and structure in theoremization culminates in such a symbolic structure. With me the point now is, is this Pyramid a structural theorem in stone, expounding God's philosophy of structure in numbers, and in the universe? If so, it must not only conform to the *philosophy* of geometry, but must be so located as to be a self-demonstrating theorem—a gnomon—of the earth's annual periodicity. If it is so constructed then, it is the embodiment of all prime metronic elements and values, and must represent an inspired architect, as Professor Smyth claims, in a *lost philosophy*, which ruled the pre-mythological ages, and from which we have all our mystic geometrical symbols, the geometry of which is a mystery even to the most learned masons and Rosicrucians in the world; while this moral is made the theme of learned orations.

My investigations into the philosophy of numbers and structure make *seven the absolute constant*, and *five*, in its multiples and powers, the *universal ratio* of relation and value. These two truths and metronic values are so certain that they wipe out all incommensurabilities—I have not struck one in eight years—and they have taught me how to formulate geometrical proportions, the *first terms only* being given, and to theoremize all proportions in triangulations. When this philosophy was worked through—seven years ago—the resulting theorem was the Pyramid, and since, I have been casually trying to get a few datic facts relative to the Jeezeh Pyramid, for the purpose of determining its archæological value, as well as its philosophical meaning and value.

I, for the present, do not touch the question of inspiration in the architect. The assumption is fair, so long as modern science does not even suspect the existence of a philosophy, in and by which the Great Inspirer of all intelligence has created the universe and all beings therein—a philosophy so all-comprehending and yet so prime in its essence that the *deka* (10) comprehends all its capable expressions. Man did not invent the digits; man cannot add to or take from them; and modern science does not even suspect that they articulate amongst themselves in exact geometrical metronic values—exactly correlating all values in structure, or all values cognizable by human intelligence.

The Bible refers to an age when man walked with God. At that age God's philosophy of structure was understood and formulated. Our modern science is the expert relict, with the philosophy forgotten. The *Kiops* Pyramid may yet, in connection with all our mystic symbols, prove this suggestion to be true. And, if so, God and truth are vindicated as surely as a special inspiration can do—besides, "the conflict" of modern science will become the monument, folly and presumptuousness.

Yours truly,

J. K. HORNISH.

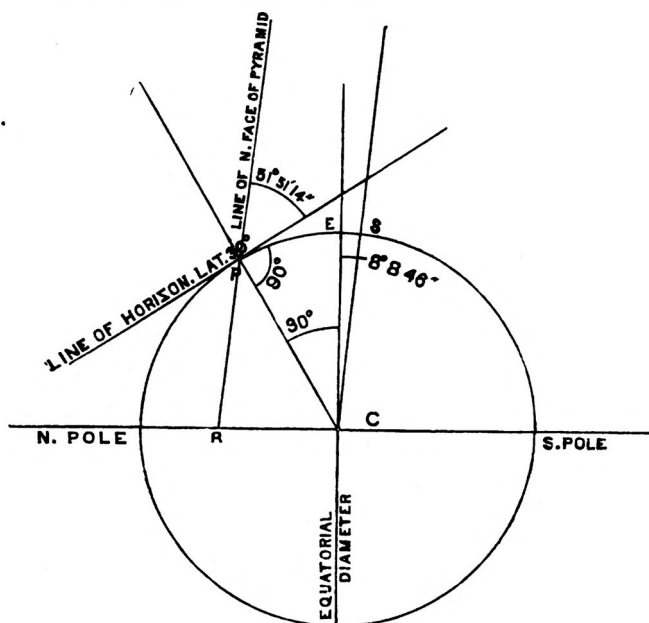
LETTER FROM REV. H. G. WOOD, REPLYING TO MR HORNISH.

SHARON, PA., April 2, 1884.

1st. The present pole star is not now to be seen from the interior of the entrance passage of the Pyramid. The altitude of the passage is $26^{\circ} 26'$. The altitude of pole

star latitude 30° is now at its lower culmination, $29^\circ 5' 45''$. In 1849 it was $1^\circ 24'$ from the pole. It has approached the pole annually since then $50''$. It is now distant from the pole $54' 15''$. Hence its altitude in latitude 30° is $30^\circ - 54' 15'' = 29^\circ 5' 45''$, which is too high by $2^\circ 39' 45''$ to be seen from the depths of the entrance passage of the Pyramid.

2d. "What relation does the sun sustain to the Pyramid at 'high 12' vernal equinox?" The following diagram gives the answer :



CS is drawn parallel to the line of the north face of the Pyramid. The angle $SCE = 180^\circ - (51^\circ 51' 14'' + 90^\circ + 30^\circ) = 8^\circ 8' 46''$; consequently the sun is about 8° south of the equator when he *begins to illuminate* the north face of the Pyramid at noon on his return from the winter solstice, or nearly one month *before* the vernal equinox.

I trust you will find these answers to the two questions, in your communication to Mr. Latimer, quite satisfactory. No doubt the Pyramid is a huge problem and of great intricacy. There is an important element yet to be contributed towards the solution of the problem, in the exact measurement of some points as yet not well ascertained. An expedition appears to be a growing necessity to accomplish the object. Hoping you will enjoy the INTERNATIONAL STANDARD,

I am, faithfully,

H. G. WOOD.

To Mr. J. K. Hornish, Denver, Col.

LETTER FROM C. PIAZZI SMYTH.

15 ROYAL TERRACE, EDINBURGH, Feb. 5, 1884.

My Dear Sir:—Your grand letter of January 22 has just arrived; its predecessors had been gradually advancing in character and importance as indications of the coming strug-

gle (friendly, intellectual, and without any manslaughter in it though it be) began to loom on the horizon of the future ; but this, your last letter, is quite a trumpet-note for preparation, each in whatever he may be able to contribute, and if you are working as we believe within lines foreordained of God, you will have a mighty spiritual army with you, helping you over many and many a difficulty, and ensuring the end at last, to those who fight valiantly ; for the Lord has never approved of cowards or idlers, but promises much to those who forget themselves in his service.

Already a friend in England has sent my wife a cutting from a paper there, the *STANDARD*, giving a paragraph descriptive of your intended expedition to the Great Pyramid, with three Americans, one Englishman and one Frenchman. If an international, or many national, character could be given at all, have you considered whether one Russian should be invited? Next to the Anglo-Saxon, the Russian has most resisted the French metrical system, and if you could penetrate through the mere superficial skin of the German exotic officials in the land, you would find the nation still opposed to it, still religiously guided, and still, for the due survey of their enormous empire, cultivating the art of mensuration and the science of geodesy.

In England it is far otherwise ; a hundred years ago, when the ordnance survey of Great Britain was started, scientific amateurs rejoiced in nothing so much as field-operations ; Ramsden made them theodolites, Traughton supplied them with Alt-azimuth circles, measuring-bars, chains and levels, while trigonometrical formulæ were discussed in all the scientific societies.

But now, what with the ordnance survey having very nearly finished off the whole of our little island's map, and the progress of physics and natural philosophy research, the great army of free and independent scientists has gone off into completely different lines of activity, and I really cannot at the moment, at all events, suggest the name of a single civilian Englishman living who has made himself known as an accurate surveyor.

Nor does there seem, after all, to me much need to search for such a one in England, or in France either ; for as a most distinguished Englishman of two generations ago set forth, the hopes of humanity in the present day rest mainly on "*bringing in the new world, to redress the wrongs of the old*;" agreeably with which your expedition, while duly attending to all which England, France and any other power may have already accomplished at the Great Pyramid, should be American entirely. Its members would possibly pull well together, and the whole work would be better done and more economically, while the size, grandeur, method and arrangement of your expedition would be such as infallibly to draw international attention to your proceedings, perhaps surround you at the place with busy critics, and perhaps also elicit some genuine and self-supporting offers of sympathy and co-operation. So, first and foremost I should like to hear of the whole of the American funds going to, not salaries to individuals, but the necessary expenses of the American expedition, as an expedition which is to crown all other pyramid explorations, and which is to work in the interests of the whole world, and of revealed religion as well.

Now you chance to have mentioned one New York paper, viz: the *Tribune* ; and I recently had a copy of that paper sent me for another purpose, viz., because it contained an essay on the recent remarkable sunsets, by Professor S. P. Langley, of Allegheny Observatory. A most excellent essay it was, the most philosophical and profound of any I have yet seen on that subject ; but I note it now because it brought up the name of an American astronomer whom I have known for many years, and have so highly appreciated his special and most original observations in many lands, that he seems to be one whom you should try to obtain on your side, viz: the Professor S. P. Langley before mentioned.

Now I have barely space to acknowledge how you astonished my wife with my portrait in your last number of the *INTERNATIONAL*. So kindly intended on your part, and

gracefully carried out, that I cannot presume now to make any further difficulty, though the oil portrait in your hall is rather too great an honor, and if it is the first, and for a time solitary, I hope it will soon be only one of a series of workers at the preserving and perfecting of primeval pyramid weights and measures.

Yours truly,

C. PIAZZI SMYTH.

LETTER FROM C. PIAZZI SMYTH.

ROYAL OBSERVATORY, EDINBURGH, Feb. 13. 1884.

Dear Sir :—This evening there arrived the tiniest parcel that book post ever brought, with a decorative sign of the International Institute for preserving weights and measures. What could it contain? Just one lithograph portrait, but that of the charming, the exemplary Abbé Chanoine Moigno, always on the excelsior path of advance in science, simultaneously with holiness to God, and faith in his written word. Such gentleness, combined with such firmness in a good cause, and capacity for enthusiasm in a high one, shine forth in his countenance, that I rejoice at this symptom of his portrait adorning, and truly so, the next number of your international journal.

The last number was a grand one in its papers, and you yourself described Luther and your country, as though you had been another Martin Luther himself. There is much more reading and studying for me in this number before I am able to write to you on some of the more important subjects, but on a certain short one why should I not attempt to set before you the thoughts that it gives rise to?

You have written to Mr. Gladstone, Prime Minister of Great Britain, requesting him to instruct some of the Royal Engineer officers at present actually quartered in Egypt and in the very line right between the Mokattam hills and the Great Pyramid, to measure that line from their own (*i. e.* the British Military Venus-transit Expedition of 1874) little stone monument erected in their camp on the said hills, as the place of which they determined the longitude telegraphically, to the centre of the mighty monument of old, the Great Pyramid, and thereby ascertain the longitude of that.

Why the officer in charge in 1874 did not make that little additional measure then, is almost inconceivable; for it amounted to the miserable egotism of preferring the camp where he had lived for a few days, and entertained sundry panhas and beys with coffee, to the one grand inspired monument of the whole earth, where it still stands, as our excellent friend Charles Casey puts it,

"Guarding historic right."

It was a moment of forgetfulness, as I always took it, on the part of a Christian officer and a gentleman, but one that on a second occasion either he or his brother officers should have been only too happy to rectify, too eager to improve; and none more so than the Prime Minister himself; for as a Free Church clergyman wrote to me recently from the west of Scotland, "Why do you not write to Mr. Gladstone to enclose, protect and repair the Great Pyramid, for he is, I believe, so holy a man that he would have all that carried out immediately for so sacred a monument." Now it seems that you have written to this remarkable man, into whose hands such extensive and unexpected power has been placed, merely to have the far smaller work of a little measuring done there by the officers of the British army who are accustomed to that kind of work, who are on the spot, and during peace cannot have much to do. And you have received an answer from the great man!

Does it satisfy—convince you? He says that in Great Britain the government rarely interferes directly in matters connected with scientific investigation; and therefore he does not see how he could himself further the object which you have in view. He suggests

whether it might not be worth your while to communicate with the Royal Society or some other scientific body."

As he does so say, perhaps it will be worldly wise on your part to apply to said Royal or some other scientific society in London, and if they undertake the work and perform it, with the perfection and publicity to give it a national character, and compel the consent of the world, you will have gained your object, and the geography of the earth will know its central point.

But if each such private society declines—says that what you want is a piece of surveying work, which is the proper business of Government, which in Great Britain the Government *always* takes to itself, and does so throughout its Colonies; that its Ordnance Survey establishment at Southampton is a most stupendous institution, exceeded perhaps only by the Indian Trig. Survey, of which the Government in London has just published vol. ix, containing exactly such longitude results in principle as are now wanted for the Great Pyramid, and executed by three British military officers who have doubtless been several times through Egypt at their country's expense—what will you do then?

Alas! I fear some very bitter thoughts may arise, touching the Scriptural part which this country is destined to fill in the present stage to which history has reached. The thoughts will be bitter to you as well as to me, for in your last letter to me you were so beautifully and sacredly loyal touching the wonderful nature of the British occupation of Egypt in 1882. Both Bishop Bedell (U. S.) and yourself "considered it struck the last death-knell of slavery, the first being that which was heralded at the coming of our Saviour." The importance of that remarkable event you say cannot be overrated or overstated. Indeed it is in accordance with the views of Pyramid students, and surely this is the meaning of the 19th chapter of Isaiah. It is strange that the British and American flags were united together in Alexandria. We are brethren and we can never be disunited."

Now it is perfectly true that the sacred prophet does say that in a certain future day which we believe has now very nearly arrived, the Egyptians shall cry unto God in their distress, and "he shall send them a Saviour and a great one, and he shall deliver them."

I do yet hope and pray that this God-favored country of ours may be privileged to perform some part of the mission of that "Saviour" prophetically described by Isaiah; my hopes rest on the whole Anglo-Saxon race, American and British combined.

I remain, yours very truly,

C. PIAZZI SMYTH.

LETTER FROM L. BIDEN.

28 LION TERRACE, PORTSEA, Feb. 2, 1884.

Dear Sir:—Approaching the Great Pyramid of Egypt from any direction, it presents the form of the Greek letter Delta, and its shape was probably the origin whence tracts of country between the divergent mouths of rivers became so named generally.

The entrance approximately exhibits the Alpha, while the boss on the granite leaf shows the Omega, the actual investigation of the marvels illustrated by the structure started in the endeavor to pass within, and they may be fully explained, as far as intended, when the goal is reached by elevation of the suspended gate in front of ante-chamber.

The erection was unquestionably divinely inspired, and all others appearing to contain sepulchral recesses seem as certainly to have been built at the suggestion of our old enemy Satan to bring the original into contempt, by causing it to be classed with those following in closer or more distant imitation in some respects, and getting the whole described as tombs, while the tradition of the vast learning and power of the directing first constructor

led to his being regarded as a prince of magicians, quite in accord with the desire of the Devil, who knew without ability to comprehend the various uses of the artificial mountain, which is founded on the rock, though surrounded by sand, and has hitherto set the dilapidating effects of time at defiance.

Yours respectfully,

L. BIDEN.

LETTER FROM J. R. SKINNER.

110 BROADWAY, CINCINNATI, O., March 10, 1884.

Dear Sir:—Your article on Isis is very interesting, especially to me, as I have lately been reading Elliott's *Horæ Apocalipticæ*, which last seems to show a prophetic history.

In looking over the Magazine I see a fact noted which is worth considering. In examining the measures of the descending passage way, I found that Vyse and Smyth coincided as far as they went downward, viz: to the bottom of the ascending passage; commencing, Vyse at the edge of basement sheet, and Smyth from a point in the roof line. I speak from recollection—Vyse gave the vertical height of the edge of basement sheet from the ground as 49 feet, as given by Smyth. You will find the work in 'Source of Measures,' page 116. Vyse measured on down to the foot of the descending passage. Smyth measured the angle of the passage with great care and corrected Vyse as to this. I worked on these data, viz: (1) the 49 feet, (2) Smyth's angle, and (3) Vyse's measures; then (4) Vyse's *restoration* of the dilapidated surface, so as to make the total length of the passage "about 4126 inches." From these, and my modulus of supposed construction, I found the *vertical height* of the restored outer and lower lip of the descending passage way above the ground to be 31 Turin cubits, divided as follows: into 30 cubits, or 51.53 feet above the pavement, and 1.71766+ feet, the thickness of the pavement, making a total of 53.24766 feet, which is 638.971 inches. From Mr. Beswick's article in the Magazine, p. 47, as I understand him, Mr. Petrie estimates this same vertical height as 638.4 inches. That is, this proves within a very slight fraction, *to duplicate Col. Vyse's restoration of the dilapidated outside*, and if so, then we are to accept the interior measures as untouched by Mr. Petrie, which gives us, *and must give us*, Col. Vyse's measure of "about 4126 inches" as the length of the entire passage. I cannot see any way of avoiding this conclusion. This being the case, then my correction, founded on the discovery of the origin and length and use of the cubit measure comes in, by which this passage is $2062.647 \times 2 = 4125.294$ inches.

Such being the case, and Mr. Beswick showing such a confusion and blunder in one of Petrie's "careful" statements as he does, as to the very feature in question, viz: the base, then the question arises: Is it reasonable, "*because Mr. Petrie was the last measurer*," to accept his to the exclusion of (1), the French corps strictly under the command of Napoleon, equipped with every means for good work, and whose work in other respects has proven to be faithful and true; (2), the measures of Col. Vyse, founded on the most laborious investigation, with a great expenditure of money and labor, especially where his work in all other respects has been proven to have been "admirable;" and (3), the results of Mahmoud Bey, made under the command of so high and august a source as the Sultan?

Your friend,

J. R. SKINNER.

ADDITIONAL LETTERS.

Rev. James French, Philadelphia, Pa.
Charles N. Dubs, Oberlin, Ohio.

George Kellogg, New York.
W. E. Hingston, Buffalo, N. Y.

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| W. J. Cockburn Muir, Melrose, Scotland. | F. G. Williams, Adams, Oregon. |
| F. Hess, Fort Dodge, Iowa. | Hon. Martin A. Foran, Washington, D. C. |
| W. C. Coffin, Allegheny City, Pa. | Dr. G. W. Copeland, East Boston, Mass. |
| B. A. Mitchell, Jr., Philadelphia, Pa. | J. C. Wilson, Mitchell Square, Ont., Canada. |
| E. Jane Copeland, Bryantville, Mass. | S. H. Reeve, South Eliot, Me. |
| Rev. Jesse Jones, N. Abington, Mass. | Mrs. S. W. Libby, Boston, Mass. |
| Charles T. Seymour, New York. | George V. Watson, New York. |
| Arthur C. Oakley, New York. | Charles Casey, C. E., Carlow, Ireland. |
| Mrs. S. A. Bradbury, Winchester, Mass. | |

SYNOPSIS OF LETTERS FOR MAY MAGAZINE.

Mrs. W. A. Plumptre writes: "I am delighted with the January number. It was a charming thought placing dear Mr. Taylor and Piazza Smyth vis-a-vis, and both are good. The contents of the number fill me with surprise and pleasurable emotion. How wonderful that Mr. Petrie should be turned into a witness for the truth of the theory instead of against it. The promptitude, decision and pains with which it has all been done, receive my warmest admiration and esteem."

With reference to the article, "The Altar and Pillar of Jehovah," Miss Alice S. Emerson writes: "I do not like the idea advanced in the last number, of Joseph's body being placed in the Pyramid. It is too material. I prefer to look upon it as entirely spiritual and symbolical. The coffer in the king's chamber took hold upon my fancy and imagination, and is not to be shaken off. I see some one agrees with me in the idea of its typifying the resurrection. I should like to know further of the writer's views concerning it."

Rev. E. P. Ingersoll, of Rosevale, Kansas, also opposes Dr. Redfield's theory that Joseph was the builder of the Great Pyramid and that his body was placed in the coffer.

Wm. E. Hingston, Buffalo, says: "I shall continue to fight for the STANDARD. I have already had many bouts with the enemy, and in all have come off victorious. Nine out of ten who are in favor of the metric system are so because of the decimal. They see the decimal only, not the great evil behind it."

Prof. W. A. Rogers, of Cambridge, writes: "Your half yard bar is at length graduated and I think you will be pleased with it. In one thing I have failed. I tried to rule a band of 10,000 to the inch, but the metal was not sufficiently hard to take good lines of that degree of fineness. I have also finished the companion of the yard and metre with my standards, and obtained the absolute co-efficient of expansion of the metre. I have yet to investigate the error of subdivision of both bars."

F. M. Robertson, M. D., of Charleston, says: "Your periodical grows in interest, and I pray that its influence in the spread of information on the noble subject which it so ably advocates may be widely spread."

Jacob M. Clark, C. E., writes: "I have been reading John Taylor's work on the Great Pyramid with a pleasure equaled only by my astonishment at the extent and soundness of his views. I am particularly struck with his idea that the sacred cubit and inch relate to the dimensions of the earth before the flood, while the Pyramid cubit, 25 inches, and the Pyramid inch express its measurement after the cataclysm. Of course we need but the one, the latter, yet how important to know all the facts that the monument reveals."

W. C. Cox, Mobile, Ala., says with regard to the expedition to Egypt: "The opening of the columns of the great New York dailies to our cause is most significant of real progress. I think it will be wise to have two or three members of the corps well versed in engineering, civil and mechanical, who are *not* committed to our belief regarding the Pyramid, that by the mouth of two or three (impartial) witnesses the truth may be established.

The N. Y. *Herald* will probably send a representative with the party, so that its operations from day to day will be published to the world."

H. L. Messervy, of Chelsea, Mass., referring to the call of the lost tribes into the American wilderness, writes: "When this emigration movement is fully understood, then the blind eyes will be opened, and Israel will understand the wonder-workings of our God. The prophecy, 'I will allure you and bring you into the wilderness, the people that were left from the sword found grace in the wilderness, even Israel when he went to cause him to rest,' was signally fulfilled in the coming of our forefathers. This nation is the stone kingdom of Daniel, and the Declaration of Independence is the corner stone on which the temple and city will be built; not a temple of stone, but 144,000 regenerated and perfected human beings. This nation is the eagle plucked from the British lion, and made to stand upon its feet (the eagle). A man's heart was given it, the Declaration of '76 (Dan. 7th chap). Here we see the woman clothed with the sun, and the moon under her feet, and on her head a crown of twelve stars, the twelve tribes of Israel. She is now in travail to bring forth the man child, the 144,000, which is the House of David. This is Joseph's land. Jacob said to Joseph, 'The blessing of thy father prevails above the blessing of thy progenitors, even to 'the everlasting hills' (the Rocky Mountains), and in the blessing of Moses upon Joseph he said, 'Blessed of Yahveh be his land.' Whose land! Joseph's, in contradistinction from the land promised to Abraham, Isaac and Jacob, and we see the blessing on Joseph's two boys literally fulfilled in this country. 'Let them grow into a multitude in the midst of the earth.'"

Rev. Joseph Wild, D. D., Toronto, Canada, writes: "I do think your Magazine is splendid; it improves with every number. I do not think it is surpassed by any periodical. I can do but little, but I often pray for you that heaven may guide and give you courage."

With reference to Mr. Gladstone's foreign policy, H. W. Oswald, San Francisco, says: "His predecessor, the late lamented Beaconsfield, had a clearer view of the destiny of Israel than has 'our William.' He was 'the Beacon' possibly too far advanced in his pronounced views regarding the future grandeur of the Saxons, but one short month of his able management of Britain's policy, at the beginning of either the Irish or Egyptian muddles, would have put an entirely different face on matters."

Mr. Joseph Baxendell, Southport, England, says: "I received the last number of the STANDARD late in the month, and read the Rev. H. G. Wood's paper with much interest, but it is based on one of Col. Clarke's equatorial diameters of the earth, and I doubt whether that is altogether safe ground to go upon, and especially as the ellipticity of the earth's figure indicated by Mr. Wood's results will not, I think, be generally received by astronomers. However, I must examine the matter more carefully before I express a decided opinion." In reply Mr. Wood says: "I think Mr. Baxendell cannot have observed that the results of my theory do not show a difference in the polar diameter of more than one hundred feet from that received by astronomers."

J. L. Dampier, of London, Ontario, after a eulogy upon Cromwell, the "St. George of his age," writes with regard to the identity question: "If we could bring to light the wondrous chain of events linked in the onward march of Ephraim and Manasseh—if we could see them mixed up with the different nations, making their way with the rest of the tribes through Europe, amongst the armed hordes of those times (Dan has left traces of his path such as the Danæ—Dan-ube, Danes—Denmark), tracing them down to their serried ranks on the field of Hastings, opposed, unknown to themselves, to their brother Benjamites—afterwards forming the choicest part of the chivalry of Europe, striving to regain Jerusalem (their native city) from the hands of the Saracens—then on, on, on, through many scenes of war and peace, guided by an unerring hand, down to the union with Scotia; then to the times of Cromwell, when was to be fulfilled the blessing on the head of Manasseh, 'as a great and a separate nation.' Then the Manassite band, leaping ashore on

that barren rock—the corner-stone of a nation—no doubt singing one of their songs of old, grandly guided by the hand of Jehovah to the promised land in safety. Thus God has borne Manasseh, as on the wings of a great eagle, into the promised land of the west. Surely there is strong enough evidence given in the case of the 'The World' against 'Anglo-Israel,' to give a full and decisive verdict for the defendants."

Mr. Theo. Gribi, of Elgin, writes: "In regard to 'The Ballard Theory of Pyramid Solution,' my expression concerning it, in one of my previous letters, was somewhat hasty and premature. I had not read Mr. Ballard's book, and the expression I used should not have been made on so superficial a notice of it as appeared in number five of the Magazine."

J. M. Durkee, referring to his paper "A Voice from the Pillar," writes: "All truth must be brought out and established before the world. 'There is a vein for the silver and the gold;' it is not for man to enjoy unless he digs for it."

At the meeting of the New York and New Jersey Auxiliary Society, on the 12th ult., Lieutenant George H. Felt lectured on "Measures as used by the Ancients." Mr. Frank H. Norton, foreign editor of *The Telegram*, says: "I had the pleasure of attending the last meeting of our section of the Institute, and of listening to the extremely interesting and important paper of Lieut. Felt on the 'Canons of Human Proportion,' a subject to which I have, incidentally, given some attention. My interest in the Pyramid question lies wholly in the direction of its astronomical reference."

Mr. J. N. Wing, secretary of the New York and New Jersey Branch Society, writes with regard to the same subject: "The meeting was a most interesting one. Though I am not a mathematician, I was greatly interested in Mr. Felt's geometric drawings. The engineers present seemed to have heard something entirely new in his discourse. One of his statements, that seven feet and seven inches are measures found in nature, and are esoteric, is hard for me to grasp; yet none of the professional gentlemen present that night could gainsay one word of his utterances. Mr. Felt is anxious to meet a body of engineers and mathematicians and lay before them his, so to speak, discoveries in the science of mathematics. There will be a meeting soon of the Liberal Club, embracing a membership of some two or three hundred men of advanced thought. Mr. Felt is to lecture before the club on his subject relative to measures, and says he will *prove* the *origin* of the *inch*. Just now I have it in mind to suggest an open debate, in some large hall, on the merits and demerits of the respective systems of weights and measures."

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

February 27, 1884.

Much interest in the proposed Pyramid expedition was elicited by the reading of a number of enthusiastic letters on the subject. Professor Smyth, in his letter, suggests the propriety of inviting the Russians and Germans to be represented in case the French and English have a delegate, but thinks it better for the expedition to be strictly American. The Professor, in another letter, expresses himself as being surprised at seeing his own portrait in the last magazine, together with that of Mr. John Taylor.

Lieutenant C. A. L. Totten, U. S. A., sent a paper on "Manufacture and Proportioning of Weights and Measures," to be read at a future meeting, and suggests Jacob M. Clark, C. E., of New York, as the proper person to rewrite John Taylor's book, 'The Great Pyramid and Who Built It,' the importance of which work has long been felt.

A paper from Professor Edwin R. Graham, of Missouri, criticising the system of weights and measures presented the Society some time since by Professor N. B. Wood, was listened to with much interest.

Mr. E. C. Frisbee, the Hartford druggist who recently attacked the French system in convention and met the defeat in his resolution only through courteously postponing the vote, had a letter among those read, saying that he should demand the publication of his remarks in the proceedings of the convention.

Mr. A. London Snowden, superintendent of the United States mint at Philadelphia, in a letter to Mr. Armstrong, of the *Plain Dealer*, writes as follows: "I refer to your paper of the date named, when it says that the new five-cent piece coined 'by order of the Secretary of the Treasury is of 5 gramme weight, 21 millimeters in diameter,' and adds 'that there is no law for its issue; that the law says 67 16-100 grains, etc.' The weight of this coin as established by the act of May 16th, 1866, which has not been changed by any subsequent legislation, is 77 16-100 grains, which is 5 grammes, so that it does not seem very important whether in speaking of the coin we indicate the number of grains or grammes of alloy contained therein, provided the grains and grammes express the same weight."

The use of 67 16-100 grains instead of 77 16-100 grains was a typographical error. What the Society objects to is the use of the term gramme instead of grain, and thus engrafting the metric term on our system of coinage.

A letter from H. L. Messervy elicited interesting discussion on the subject of races, which was participated in principally by Drs. Newcomer and Redfield. Other letters were read from Rev. James French and Charles Casey, C. E., of Ireland.

The members elected were:

Dr. G. W. Copeland,
George V. Watson,
J. K. Hornish,

Boston, Massachusetts.
New York.
Denver, Colorado.

Meeting adjourned for two weeks.

March 12, 1884.

An extract from the New York *Tribune* proves that the metric advocates are making vigorous efforts to oppose the work of the International Institute. The writer says:

"Professor Piazzi Smyth, Astronomer-Royal of Scotland and author of a very strange book entitled 'Our Inheritance in the Great Pyramid,' has written to this country suggesting the propriety of including Russian and German scientists in the projected Pyramid

expedition, provided England and France are represented, though he would prefer that the expedition should be strictly American. Inasmuch as Mr. Petrie's Pyramid measurements at Ghizeh appear to leave no room for further work of that kind, being laboriously exact and exhaustive; and inasmuch as the result of Mr. Petrie's measurements is to upset all, or nearly all, the peculiar theories of Professor Piazza Smyth in regard to the significance and uses of the Great Pyramid, it is perhaps in order to inquire what special good is likely to result from the proposed expedition. The relation between the Pyramid and the 'Anglo-Saxon metric standard' seems already disproved, and the astronomical hypotheses of the Scotch Astronomer-Royal had fared no better in the hands of an unbiased measurer. In short, a natural termination of pyramidal fantasies appears to have arrived."

This slip was sent to the society by Mr. W. H. Searles, with the following comments: "The article shows that the conservative prejudice of the Royal Society is not without adherents on this side of the Atlantic. It might be well to let the *Tribune* have the advantage of the international standard."

Mr. Latimer stated that Professor Barnard, of Columbia College, a staunch adherent to the metric system, and president of a society for its introduction in this country, was a contributor to the columns of the *Tribune*, and that the article was probably inspired by animus to the International Institute. He said that he had recently met several Columbia College students, and that they had asserted that they knew nothing of the rival system, as they had been taught the metric exclusively. A letter from a correspondent in New York made a similar statement. Professor N. B. Wood said that many were devoted to the metric system, apparently for the reason that they considered it more scientific, but could give no well grounded reasons for their preference. Professor Wood is making a set of weights for the Society, having the Anglo-Saxon units adapted to a decimal scale.

A report of the Connecticut Pharmaceutical Association gave the discussion on the resolution of Mr. E. P. Frisbee: "Resolved, that the adoption of the metric system would be detrimental to our best interests as pharmacists and business men." Though the resolution was lost by a rising vote of 9 to 13, it occasioned an animated debate and will doubtless bear fruit in the future. Mr. Frisbee stated that only one machine shop employed the metric system, and that had been a failure. Mr. Gessner thought that pharmacy need not be governed by machine shops, and called attention to the variations in av. oz., tr. oz., apoth. oz., which were avoided in the new system. He disliked the idea of putting themselves on record against an improvement. In the meeting last evening Professor Wood confuted Mr. Gessner's remarks on this subject, as he said that pharmacy did not employ the av. oz., that therefore the objection was futile. Mr. Bond inquired what machine shop had employed and abandoned the metric system. Mr. Latimer replied that it had been used in the celebrated works of William Sellers & Co., and after a trial of about twenty years branded as unworthy of adoption. Mr. Sellers pronounced it as inconvenient, cumbersome and requiring more figures to accomplish the same work. He says that it is not capable of mental solutions with correctness in any ratio in comparison with our system of *inches*, nor is it equally capable of subdivision to the average workman.

A letter from Rev. E. P. Ingersoll, of Rosevale, Kansas, attacked Dr. Redfield's supposition that Joseph was the architect of the Great Pyramid and the first great master mason.

Dr. Redfield replied and gave some thoughtful reasons for his opinion. A discussion followed which was participated in generally.

Letters were also read from J. K. Hornish, of Denver; J. N. Wing, New York; Cockburn Muir, Scotland; Thomas Holland, London, England; Lewis Biden and others.

The following persons were elected members:

Charles T. Seymour,
George Kellogg,

New York City.
New York City.

Alex. Gibson,
George M. Cox,
William E. Hingston,

Norwalk, Connecticut.
Chatham, Ontario.
Buffalo, New York.

The meeting adjourned for two weeks.

March 26th, 1844.

An unusually large audience assembled in the hall of the Society. The Novelty Iron Works Glee Club, at intervals during the evening, sang appropriate songs. A letter on pyramidal free masonry, from Rev. E. P. Ingersoll, of Rosevale, Kansas, was read by the secretary. Mr. Ingersoll has been a freemason for more than fifty years. He does not believe that the teachings of free masonry benefit mankind either morally or intellectually, and repudiates the ideal that the Great Pyramid was built by freemasons, and that they held its secrets. Though his letter was received with attention, the conclusions of Mr. Ingersoll were not accepted by a majority of the members present.

The president read an extract from an article on "The Metrology of the Great Pyramid," by President Barnard, of Columbia College. Dr. Barnard speaks with scorn of the Pyramid faith and the disciples of the Pyramid religion. He says: "Of the pretension of the Pyramid theory, that in the longitudinal dimensions of its passages we have a record (prophetic it must have been) of the most important epochs of human history, it is difficult to speak seriously. If we were dealing with periods of which authentic annals have come down to us, as of the capture of Constantinople, or of the Declaration of American Independence, it would be easy to subject this pretension to an unimpeachable test. But of the three dates which are specified as distinctly indicated in this monument, viz.: the dispersion of mankind at Babel, the exodus of the Israelites from Egypt and the birth of Christ, to which we may add a fourth—the date of the foundation of the Pyramid itself—there is not one which is not contested." This paper will be discussed at a subsequent meeting.

A letter from Mr. S. G. Arnold, of Washington, in discussing the disagreements with reference to the length of the base side of the Pyramid, commends the careful work of Mr. Petrie, and acknowledges the benefit we derive from his measurements.

F. H. Hess, of Fort Dodge, Iowa, writes with reference to the correction of the calendar. He says that the fifty years' period seems more natural and rational than our present leap year period, which destroys the cycle of seven years corresponding to the fundamental division of time into the week of seven days, the mystic period of creation. He suggests that the twelve months of the year should be divided into full weeks, by giving to March, June and September thirty-five days each, to December thirty-six days, and to all the others twenty-eight days each, we should have the further advantage of having every month of the year begin with the same day as the month beginning the year, and the first day of the year and of each month would rotate through the week in regular succession for $7 \times 7 = 49$ years, after which a year of jubilee of three hundred and seventy-seven days, in which each month would have one more day than in the common year.

The president read a paper from S. H. Reeve, S. Eliot, Me., and illustrated it by black-board diagrams.

F. H. Hess, Fort Dodge, Iowa, and A. C. Oakley, New York, were elected members. Meeting adjourned for two weeks.

April 9, 1884.

The Secretary's report showed that the receipts of the Institute from membership dues and donations for the months of January, February and March were \$324.05.

A letter from Robert C. Hine, New York, inclosed a clipping from the *Evening Telegram* headed "To Study the Pyramids—The Proposed Expedition from This Country—Its Object." The writer ridicules the idea of an American scientific expedition for this purpose, and says: "Mark Twain's story of the frogs and other animals who went on

scientific expedition in which they met the steam locomotive and expressed their various views as to what it was, is to be surpassed by an expedition to Egypt by a number of members of the International Institute for Preserving and Perfecting Weights and Measures for the purpose of examining the pyramids." A professor of Columbia College, a firm believer in the French metric system, said to a *Telegram* reporter: "I think if the expedition is made, the money furnished to defray the expenses will simply be lost. Although I believe the object of the expedition is for the purpose of discovering the weights and measures of the ancient Egyptians, I cannot imagine of what use such information will be. The great system and the one coming into use all the time is the metric. President Barnard, of Columbia College, President of the Metric System Society, is writing on the Pyramid of Ghizeh, and will shortly make his work public."

The fact that the faculty of Columbia College and the advocates of the metric system are now employing the columns of the New York press to ridicule the objects of the International Institute proves that the adversary of whom they once spoke with contempt as unworthy of attention has so developed in power as to arouse them to hostile action and to demand the earnest efforts of one of their most able advocates to oppose his claims. The work of President Barnard on the Pyramid of Ghizeh will be one of the best advertisements of the strength of the International Institute, and as such will be received with welcome by the members.

The chairman, referring to Dr. Barnard's criticism upon the Pyramid measures, presented the following for the consideration of measurers: The coffer length in the Great Pyramid is 90 inches, the height 41.25 and the depth 34.37 inches; deduct the depth from the height and you have the bottom thickness equal to twice the depth divided by 10, 6.875 inches. The Pyramid is in latitude 30 degrees north. Take the circle of this latitude 360 degrees in minutes equal to 21,600; the diameter through this latitude is 6,875 miles; the radius is 3,437.7 miles. Mr. Wood has shown the close approximation, if not exactitude, of a minute of arc in this latitude to one mile, 5,280 feet. In this Mr. Beswick agrees and has also shown the earth relations thereto. 360 degrees multiplied by 60 minutes equals 21,600 minutes; 21,600 multiplied by 5,280 equals 114,048,000 feet. One ten millionth of the radius of this circle (18,151,284 feet) is 18.151 feet or 1 foot 9.78 inches, the common Jewish cubit as Mr. Wood has shown. We have therefore every reason to believe that the measures of the coffer agree with the measures of the earth in latitude 30 degrees circle, and that all agree with the British measures. Here we have the lotus flower of the Pyramid.

One lady suggested that the coffer was the symbol of the resurrection. This looks like a resurrection of our measures as related to the earth. Dr. Redfield said that man was related to the microcosm and that it would seem fitting that he should have been laid in a coffer of such relations as that to the earth.

Professor Piazza Smyth writes: "Let me applaud your idea that the European countries which have adopted the metre are those which were conquered by Napoleon Bonaparte and those which have not adopted it are those which Napoleon tried to conquer but could not, God overruling him."

A paper on "The History of the Great Pyramid," by Rev. Jesse H. Jones, traced in a lucid and interesting manner the course of pyramid discoveries and the development of doctrine.

Edwin Wilmshurst, of Retford, England, sent the Society a work from his pen, 'Glimpses of Our Celtic Ancestors,' which will be reviewed in the INTERNATIONAL STANDARD. He sent also a branch of yew from the grave of John Taylor.

An article by J. Ralston Skinner, in *Our Rest*, was read by the President. Mr. Skinner says: "There is coherent, continuous and systematic language contained in, and concealed under the Hebrew text of the Pentateuch, by which the Great Pyramid is described as to the system of its measures, and other words of application. This language proves

this part of the Bible, from the very first word of Genesis. Strange to say, it is based on two arithmetical ratios, without which it cannot be read. These ratios are 6561 to 20612 and 113 to 355. They are ratios expressive of what we call Greek π , and are founded on the grammatical relation of diameter to circumference of the circle.

The part which the land of Egypt is made to take in the divine economy of the Bible is essential, because '*Out of Egypt have I called my Son.*' The name of this land of itself contains the symbol of its essential importance in a picture; and this is its representation. Sketch a river of *water*, with a *rock* pyramid on its bank. The Hebrew word for *water* is *mim*, and that for the pyramid rock is *tsr*. Place these letters as shown in the sketch.



Read the word *water* and *rock* combined, and we have מצרים. Refer to your Hebrew Bible and you will see that this is the word used for *Egypt* throughout in the text. The signification is the '*Rock at, or out of Water,*' or the '*Water out of the Rock,*' and the representation is made by Moses at Mount Horeb, in this determined shape. Under the figure of *Mount Sinai*, this is made to become the veritable mountain, on which Jehovah descended in *fire*. Jehovah sanctified this מצרים, or *Pyramid of the Waters*, and it is the substance of the Mosaic Books, out of which substance sprung the divine laws and ordinances. This pyramid was called '*The Ancient of Days.*' "

A letter from Professor Leconte Stevens, of Packer Collegiate Institute, asked for information respecting the organization and aims of the Institute. Mr. Stevens' letter and Mr. Latimer's reply were read by the Secretary.

Some specimens of Egyptian mummies were recently received by Mr. Edwin Cowles from Dr. Pomeroy, American Consul at Cairo. They are now on exhibition at the rooms of the Society. One remarkably well shaped head has evidently been covered with gold leaf, and is apparently the remains of a person of high rank.

Horace Smith's "Address to an Egyptian Mummy" was read by the Secretary.

A letter from J. K. Hornish, of Denver, Colorado, was also read.

The members elected were :

W. W. Armstrong,
Mrs. H. E. Godfrey
F. A. Kempt,
Alonzo Kasson,
John F. Shaw,
F. A. R. Winter,

Cleveland, Ohio.
Grass Valley, California.
Hartville, Missouri.
Elk Point, Dakota Territory.
Toronto, Ontario.
Georgetown, British Guiana.

In consequence of the large number of letters and papers on hand a special meeting was appointed for the 16th inst.

MONTHLY RECEIPTS FROM SUBSCRIBERS TO THE INTERNATIONAL STANDARD.

INTERNATIONAL INSTITUTE, NOVEMBER, 1883.

[THE SOCIETY'S YEAR BEGINS NOVEMBER 8TH.]

NOVEMBER.

W. K. McAllister, Garden City, L. I.....	\$ 2 00
Amory Coffin, Phoenixville, Pa.....	2 00
Professor E. R. Graham, Fairville, Mo.....	2 00
J. Nehab, Ph. D., Garden City.....	2 00
Ole Olsen, Elgin, Ill.....	2 00
James H. Moore, New York.....	2 00
J. L. Dampier, London, Ontario.....	4 00
R. P. Lowe, Washington, D. C.....	2 00
Capt. R. Kelso Carter, Chester, Pa.....	2 00
W. J. Spicer, Montreal, Canada.....	5 00
Thomas E. Douglas, Mansfield, O.....	2 00
Hon. John B. Jarvis, Rome, N. Y.....	2 00
F. A. Von Gassy, Effingham, Ill.....	2 00
W. A. Sweet, Syracuse, N. Y.....	4 00
Gen. C. B. Norton, Boston, Mass.....	2 00
Edwin Wilmshurst, Retford, England.....	2 44
R. B. Lockwood, Binghampton, N. Y.....	2 00
Theo. Faber, Brooklyn, N. Y.....	2 00
Rev. E. P. Adams, Dunkirk, N. Y.....	2 00
Rev. J. F. Fahs, Akron, O.....	2 00
Sidney J. Sanford, Barrie, Ontario.....	2 00
W. C. J. King, Barrie, Ontario.....	2 00
R. W. Crompton, Barrie, Ontario.....	2 00
T. G. Armstrong, Jamestown, N. Y.....	5 00
P. Bowen, Cochranon, Pa.....	2 00
Rev. M. L. Streater, Helena, Montana.....	2 00
Spencer H. Smith, New York.....	2 00
Joseph T. Moulton, Chicago, Ill.....	2 00
Wm. Rundquist, Elgin, Ill.....	2 00
Rev. Chas. Hardon, Contoocooke, N. H.....	2 00
John Bliss, New York.....	2 00
W. W. Evans, C. E., New Rochelle, N. Y.....	2 00
Dr. Porter W. Taylor, Cleveland.....	2 00
J. A. Bidwell, Cleveland.....	4 00
Justin Holland, Cleveland.....	2 00
James S. Lawrence, Cleveland.....	4 00
Geo. H. Kelley, Cleveland.....	2 00
P. Collopy, Cleveland.....	2 00
James McIntyre, Cleveland.....	2 00

R. Gurley, Cleveland.....	2 00
James F. Clark, Cleveland.....	2 00
Wm. H. Searles, Jersey Shore, Pa.....	2 00
J. W. Alsop, Galion, O.....	2 00
E. Collopy, Youngstown, O.....	2 00
Wanzer Holcomb, Ravenna, O.....	2 00

 \$104 44

DECEMBER.

O. B. Main, Cleveland.....	2 00
Joseph Hugill, Akron, O.....	2 00
Rev. R. E. McDaniel, Vandalia, Ill.....	2 00
Mrs. Moses Hill, Kalamazoo, Mich.....	22 00
Joseph W. Frey, Los Angeles, Cal.....	5 00
S. H. Reeve, South Elliot, Me.....	2 00
Arthur Bates, Meadville, Pa.....	2 00
Charles Casey, Carlow, Ireland.....	4 75
Victor H. Ernst, Jersey City, N. J.....	2 00
J. H. Drew, Norwalk, Ohio.....	2 00
Lewis Biden, Portsea, England.....	2 19
Wm. Hart, Elgin, Ill.....	2 00
Mrs. J. R. Smith, New York.....	2 00
Michael Keating, Oil City, Pa.....	2 00
Joshua Douglas, Meadville, Pa.....	4 00
Dr. J. V. Reynolds, Meadville, Pa.....	3 00

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JANUARY, 1884.

G. L. Heisel, Cleveland.....	2 00
Rev. M. Murphy, Cleveland.....	4 00
C. T. Heisel, Cleveland.....	2 00
W. E. Bond, Cleveland.....	2 00
D. W. Gage, Cleveland.....	2 00
R. H. Lewis, Cleveland.....	10 00
Miss Rosa Crampfort, Cleveland.....	2 00
L. W. Perry, Cleveland.....	2 00
A. G. Bryan, Galion, O.....	2 00
W. C. Durgin, Galion, O.....	2 00
James Mackey, Youngstown, O.....	2 00
John N. Poage, Cincinnati, O.....	2 00
R. W. Burnet, Cincinnati, O.....	5 00
Geo. M. Howells, Flushing, N. Y.....	1 00
John Jay Laman, C. E., Cleveland.....	2 00
Professor C. Piazza Smyth, Edinburgh, Scotland.....	6 09
H. A. Powers, Cincinnati, O.....	2 00
P. Govay, C. E., Velay, Indiana.....	2 00
John N. Poage, Cincinnati, O.....	10 00
C. V. Kasson, Detroit, Mich.....	2 00
Geo. Staples, McKean, Pa.....	2 00
Joseph Churchyard, Buffalo, N. Y.....	10 00
J. J. Williams, C. E., Jackson, Tenn.....	2 00
John G. Godwin, London, England.....	2 44
Rev. J. A. Upjohn, Neenah, Wis.....	2 00
Cook Talcott, New York.....	2 00
Jesse Fosdick, Salamanca, N. Y.....	2 00

Monthly Receipts.

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S. G. Arnold, Washington, D. C.....	2 00
George Boyce, Sharon, Pa.....	2 00
A. S. Dunbar, Meadville, Pa.....	2 00
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EDITORIAL NOTES.

We are now prepared to furnish bound volumes of the Magazine. The members and others will do well to take advantage of the opportunity to purchase the volume for 1883, which can be sent, postage free, for \$3.00.

In the next number of the Magazine we expect to commence the publication of a tabulated list of all the measures made of the Great Pyramid, so that all readers and students can have them on hand for reference and calculation. Mr. Petrie's late measures will be added to the list.

Friends, help us in our work. You know the object is worthy. You know that it is unselfish. You know that it is not a money-making scheme. You know that it is a work for our race. Give us a helping hand and heart in this work for a noble and God-like purpose.

REVIEWS.

GLIMPSES OF OUR CELTIC ANCESTORS, WITH ENGRAVING OF THE DEDICATION STONE OF THE TEMPLE OF NEPTUNE AND MINERVA, DISCOVERED AT CHICHESTER, SUSSEX. By E. Wilmhurst, Retford, Notts, England.

We regret that this interesting pamphlet arrived as we were closing this issue of the Magazine. We will give extracts in a subsequent number.

THE STUDENT'S JOURNAL.

This excellent phonographic journal is published by Andrew J. Graham, New York, of The Reporters' List. Hyphenized

exercises and phonographic reading exercises are invaluable to the student of phonography, while the departments devoted to hygiene, philology, biography, etc., are interesting and instructive to the general reader.

FACTS AND DATES, OR THE LEADING EVENTS IN SACRED AND PROFANE HISTORY AND THE PRINCIPAL FACTS IN THE VARIOUS PHYSICAL SCIENCES, THE MEMORY BEING AIDED THROUGHOUT BY A SIMPLE AND NATURAL METHOD. By the Rev Alex. Mackay, LL. D., F. R. G. S.

The first division of the book contains scientific, the second, historical facts.

In the system of mnemonics adopted, the consonants of the English alphabet are employed to express numbers, the five vowels being disregarded, and the half vowels (*w, y*) being used to denote the cipher (0) as also the letter *x*.

This leaves 18 consonants to express the 9 numerals. The first two (*b, c*) denote 1; the second pair (*d, f*) 2, and so on.

<i>b, c</i> = 1	<i>j, k, s</i> = 4	<i>p, q, z</i> = 7
<i>d, f</i> = 2	<i>l</i> = 5	<i>r</i> = 8
<i>g, h</i> = 3	<i>m, n</i> = 6	<i>t, v</i> = 9
	<i>w, x, y</i> = 0	

To fix in the memory any fact in science, or any event in history, a short sentence bearing on the fact or event is constructed in such a way that the *first consonants of the several words* express the figures or numerals in the number to be remembered.

Example.—The distance of the earth from the sun is 92 (millions of miles, understood), and the mnemonic sentence, intended to yield up this number, is “the world’s *true distance*.” Here the first three consonants are *w, t, d*, which denote 0, 9, 2, or simply 92, as the cipher on the *left* has no value. Ex. 2.—Date of the deluge, according to the Septuagint, B. C. 3216; the mnemonic sentence is: “a *general deluge covers the mountains*.” Here the four first consonants are *g, d, c, m*, which denote 3, 2, 1, 6, or 3216. In each example the *article* is disregarded.

INQUIRERS' CLUB.

What is the Pyramid inch?—What relation has the British inch to the earth's diameter?—What is the possible error in the polar diameter?—What is the possible error in the metre of the French system?

C.

BROOKLYN, N. Y., April 4, 1884.

Query?—Will you be kind enough to let me have answers, as brief as you think necessary, to the following questions?

1. When was the "International Society for Preserving Weights and Measures" organized?

2. Is there but one office of the Society in America, or have you various branches? If so, where are these branches, and what American scientific men are most prominently the advocates of the measures for which the Society is organized?

3. What branches has the Society in Europe, and who are the scientific men there as its most prominent representatives?

4. Do you advocate the preservation of the various English weights and measures now in use, such as the ounces and pounds, troy and avoirdupois? If so, what European societies outside of England are committed to your support? If not, what do you propose to substitute?

5. If a substitute has been agreed upon, what guarantees of support have you in America?

6. If Piazzi Smyth's "Pyramid inch" and "sacred cubit" are to be adopted, is there any reason to hope for a change to these units by legislative action?

7. If the Society is committed to the preservation of existing weights and measures, such as the ounces of $437\frac{1}{4}$ and 480 grains respectively, the yard of 36 inches and rod of $5\frac{1}{4}$ yards, the gallons of 231 and $277\frac{1}{4}$ cubic inches respectively, the tons of 2,000 and 2,240 pounds respectively, the quarts of $57\frac{1}{4}$ and $67\frac{1}{4}$ cubic inches respectively, is it thought that such diversity is desirable, or is it that the immediate inconveniences attendant upon change overbalance the future advantages to be derived from abolishing multiplicity of units the same in name?

Please not understand me to be asking these questions in the spirit of an advocate on either side of the controversy. I will frankly say that as a teacher of physical science I have for many years past been in the habit of using the metric system because of its simplicity and definiteness. I have read Piazzi Smyth's book, 'Our Inheritance,' etc., as well as President Barnard's recent criticism of it in the School of Mines Quarterly, and I wish simply information as to the objects to be attained by your Society. I have not thus far seen any copies of the journal of your Society.

Perhaps some of my questions may be already answered in print. If any of them are not, and if you will return them with your answers, I shall be much obliged.

W. LECONTE STEVENS.

Answer.—The International Society for Preserving and Perfecting Weights and Measures was organized on the 8th day of November, 1879, at Boston, Mass. The principal office of the Society is in Cleveland; there is a secretary located in Boston. The Boston Society is small, and the publications are all issued here. Meetings have been held here every two weeks for the last four years and a half. There has been a society formed in New York. Clark Fisher, C. E., is acting president of it, and Mr. J. N. Wing, of Scribner and Wellford, Astor Place, is secretary. They meet

every two weeks. There are no branch societies in Europe yet. We have some six hundred members. The societies are not numerous; the organization is new and the means thus far have not been large enough to have societies in different parts of the world. It was contemplated, however, to accomplish this.

We advocate the preservation of the units of the Anglo-Saxon weights and measures. We do not advocate the preservation of all the cumbrous tables. We believe in the inch, foot, yard, mile, grain, ounce, pound, &c. We would have multiples of the units so that there could be no possible misunderstanding. We would not oppose, and we are working upon, a decimalization of our system, but we would not be held down to decimalization, but would also have duodecimals. Our first work is to prove the value of the Anglo-Saxon system and to show that it is earth-commensurable and has a foundation of great value. We are not willing, therefore, to substitute for it the new system, which is imperfect in its relations to the earth. We do not propose, and we do not think it necessary, to adopt the sacred cubit as our standard, nor the Pyramid inch. But our researches rather go to show that the British measures are perfect as regards our inch to one particular measure, namely, of the diameter of the circle of 30 degrees latitude in which the Pyramid stands and hence to the Pyramid inch. Inasmuch as there are a great number of persons in the Society studying and trying to devise means to simplify our tables, and working on the relations of these units to measures of the earth, we believe that from these studies there will be evolved a perfection of our own system very superior to that of the French. We do not think it desirable to commit ourselves to various sized pounds, tons and gallons, but are seeking for the simplification of all these.

I am glad that you have read Piazzi Smyth's book, 'Our Inheritance in the Great Pyramid,' and I am also pleased that you read Professor Barnard's recent criticism. We might well exclaim, "O, that our enemy would write a book!" and we are very much pleased that Professor Barnard is now putting himself on paper. At first he ridiculed the theory that the Pyramid could have any weight in determining our weights and measures, but the "fanaticism" of following Piazzi Smyth has aroused his indignation, and he is obliged to put forth his herculean strength to wipe out these "cranky" people at one fell blow and put us where we belong; but he will find that we will be like Banquo's ghost—we will not down, and he will have to retract much that he has written. He shows ignorance of many things, and one of the things that he thought the least important when he adopted the French metric system and declared himself the champion of it in this country, was to investigate what was the value of that which he was going to throw away, namely, our hereditary units of weights and measures. A man of such erudition as Dr. Barnard, and of such strong religious conviction and knowledge, would have done well to have paused before he destroyed the bridges behind him; but he has done so and there he is. Let the sequel prove. We are willing to abide by the truth and stand or fall by it, and we are not at all afraid either of his criticism or that of his friends. We have a great TRUTH to promulgate, and we propose to do it. We propose to prevent our people from adopting the French system illogically and casting aside that of the origin of which they are entirely ignorant as a general rule. We hope to prevent them from having that shame which would be theirs should they throw away their own weights and measures before they know whether they are right.

I should be very glad to have you take our Magazine; it will cost you \$2.00 a year. We should be glad to have you as a member, but I see, as a metric advocate, you cannot join us, but you might be instructed by reading our publications. We have scientific men in the work, but we do not throw aside papers because they are not scientific. We hope that they are logical. Some of them are very strongly criticised, and yet many of them are from very sensible men; although many are speculative they are very suggestive. Some of them are of very great value indeed, as you will find, and I trust that you will be convinced.

CHARLES LATIMER.